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Until further notice our office hours are: Mondays to Fridays
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ANSWERS TO ENQUIRIES

By reason of staff shortage due to enlistment, we regret that it is no longer possible for us to answer enquiries involving research, or to supply dates when articles appeared in back numbers, either by telephone or by letter

ERRORS, PAPER, AND PRINTING

Owing to shortage of staff and altered printing arrangements due to the war, and less time available for proof reading, we ask our readers' indulgence for typographical and other errors they may observe from time to time, also for poorer paper and printing compared with pre-war standards

Great Britain's Overseas Trade

THE first six-monthly returns of overseas trade issued by the Board of Trade since the outbreak of war show that in the first half of 1945 United Kingdom exports amounted to £173,042,174 as compared with £130,790,958 for the first half of 1944. Imports amounted to £598,000,000. The value of re-exports was £23,000,000. The totals in all cases exclude munitions, and the better appearance of the export figures is in part a result of the inclusion of goods for which no payment is received in overseas currency, such as essential goods to liberated countries in Europe. Indeed, of the total increase in exports, nearly two-thirds was accounted for by increases in shipments to Europe, but it has also to be remembered that although exports are up to 40 per cent. of the 1938 level, the volume of goods is masked, in part at least, by the rise in export prices of 185 per cent. of the 1938 level. Since the period to which these figures apply it is probable that there has been a further improvement in the export position, but it is clear that the beginning which has been made in the resumption of British overseas trade is still small. It is believed that it is intended to issue the trade returns at quarterly intervals from now onwards. A resumption of the pre-war monthly returns would give a better and more valuable picture of trade progress.

Railway Rolling Stock Orders for Great Britain

It is known that there is no lack of demand in many parts of the world for British railway rolling stock, and that in many cases the problem is to devise means of meeting the calls on the British railway equipment industries, and to ensure that reasonable priority is accorded to the more urgent requirements. Mr. A. F. Kirby, General Manager of the Palestine State Railways, who visited this country recently, is now back in Haifa, and he is reported to have told Reuters that while in Great Britain he had placed orders for rolling stock to the value of £500,000. Delivery is not expected before the end of 1947. Mr. F. C. Sturrock, the Minister of Transport in the Union of South Africa, has also told Reuters that he proposes to send a mission to Great Britain in the course of the next month or so to order rolling stock and other requirements for the South African Railways & Harbours. The fact that orders for overseas civilian use are again being placed is satisfactory, but, before British manufacturers can get into their stride for the overseas markets, problems of labour and materials will have to be tackled by the Government more resolutely than they have been so far.

Trade with Colombia

The United States enjoys a predominant position in trade with Colombia, but a review* of commercial conditions with that country, issued by the Department of Overseas Trade, suggests that if British exporters are in a position to re-enter the market soon, and an intensive publicity campaign is undertaken, there is no reason why this country should not at least retain its pre-war share in that trade. In 1939 Colombia imported £2,230,000 from the United Kingdom, compared with £12,724,000 from the U.S.A. Colombia's imports of iron and steel, and manufactures of them, were £3,114,000, and of machinery and apparatus (other than electrical) £2,951,000; electrical machinery and apparatus amounted to £1,176,000. Colombia has about 2,000 miles of narrow-gauge railways. The State operates 1,400 miles of track and the Departmental authorities 460 miles. The remainder is privately owned. The Dorada Railway Co. Ltd., which operates a 70-mile line, is British owned. The Government's programme envisages various extensions to the railway network. The most important is the mountainous link between Ibaque and Armenia; this, by connecting the Pacific Railway from Buenaventura and the Girardot line from Bogota, will provide direct railway communication between the capital and the Pacific ports. Another proposed line of considerable importance is the extension of the Bogota-Chiquinquirá line northwards to Bucaramanga and thence to Cucuta near the Venezuelan frontier; this, when completed, will give Bogota a direct rail connection to the lower Magdalena River and Venezuela.

Siamese State Railways

With the collapse of Japan the freeing of the Siamese State Railways from enemy control is now assured. When Siam was invaded in December, 1941, it was not possible for her effectively to resist the Japanese request to allow the passage of their troops destined to attack Malaya. A proclamation of neutrality was, indeed, made, but within a few hours the party then in power declared war on Great Britain, so that Siam had to be treated by us as an enemy country. Construction of the first Government

* "Colombia: Review of Commercial Conditions." H.M. Stationery Office. Price 1s.

line began in 1892, and the system for some years consisted of two sections, on different gauges, separated at Bangkok by the River Menam Chao Phya. The earliest main line was planned to run from the east bank to Chiang Mai, the capital of the north, 466 miles, and was on the standard gauge. It reached Korat, 164 miles from Bangkok, in 1900, and Chiang Mai in 1922. All the earlier State lines, including several important extensions, were laid to standard gauge, but the construction of the southern main line, from 1900 onwards, brought into being a metre-gauge system. This was extended to provide a connection—opened in 1918—with the metre-gauge lines of Malaya, and in 1919 it was decided, in view of possible links with the metre-gauge lines of Burma and Indo-China, to make the Siamese system metre gauge throughout. An important step in this direction was the opening in 1927 of the Rama VI bridge across the Menam to connect the two sections, but the complete conversion of the northern line was not effected until April, 1930, since when the system has been metre gauge throughout. We have no official figures later than 1939. These show a total length in operation of 1,926 miles.

Railway Improvements in East Africa

East Africa's most important railway centre, Nairobi, has changed considerably since the days when the pioneering Kenya & Uganda Railway sent fifty trains a month through the station. The traffic now is about that number a day, and important changes are taking place to speed up both goods and passenger operations. The Colonial Office states that a new reception yard recently completed and a covered island platform a quarter of a mile long, now under construction, are two of the improvements. Locomotive coaling has been speeded by the completion of a reinforced-concrete coal hopper early this year. The hopper is fed from a steel hoist with electrically-operated tip wagons. Another improvement at Nairobi is provision for interlocking signals and points. This has been a feature of main-line working on the Kenya & Uganda Railway for many years, but in Nairobi yards, signals and points have been operated independently from ground lever frames. Nairobi's first signal box is being built, and, from it, all signals and points connected with the main line at the east end of the yard will be controlled. Later, the tracks in the centre and west end of the yard will be dealt with similarly. All the improvements at Nairobi and several other depots have been designed and are being constructed by the Civil and Mechanical Engineering Department of the Kenya & Uganda Railways to the requirements of the Transportation Department.

Military Workshop Trains

During recent years we have had ample evidence that modern warfare is largely a matter of movement, and the railways, in every theatre of war, have made an unprecedented contribution to the handling of vast numbers of men and quantities of supplies. It is small wonder that railways everywhere were singled out as targets for enemy action, with inevitable consequences to track and trains, bridges and buildings. Railway workshops and maintenance depots received their due share of destruction, and, to overcome the difficulties occasioned by the lack of repair and servicing facilities, mobile workshops were instituted by the Army authorities for use on European railways. The provision of these trains presents a striking instance of the ingenuity displayed by British railway engineers in dealing with the serious dislocation of railway communications widespread throughout a number of fast-moving battle fronts. An illustrated description of one of these military workshop trains, fitted out by W. G. Bagnall Limited, and Cowlshaw Walker & Co. Ltd., is given elsewhere in this issue.

Railway Welfare in South Africa

The efficiency of the railway service is so closely bound up with the health and contentment of the staff, that no management can afford to neglect these vital factors. In no country is this more fully realised than in South Africa, where the State-owned transport services employ 143,000 persons, of whom 61,000 are Europeans. The aim of the management always has been to follow a comprehensive welfare and social security policy, with which preventive and positive health measures, as well as mental and social uplift, are closely associated. Staff welfare work has been recognised as a science, requiring skilful direction by a highly-trained personnel, supplemented by the enthusiasm of the staff. On the South African Railways, some of the problems to be dealt with often have strictly local aspects. Certain measures adopted in areas where large numbers of staff are concentrated would prove unworkable in the smaller centres or at isolated stations, where educational facilities are wanting, and where little recreation is available. Special attention is paid to the needs of the non-European staff. The central organisation is under the control of the Railway Health Officer, assisted by a committee of senior officers, and by the welfare staff.

Restoring the Railways of Devastated Europe

The efforts now being made to restore and re-equip the devastated railways of Europe are described in the report of the Provisional Organisation for European Inland Transport, recently submitted to the Conference on European Transport, held in London. Working in conjunction with the United States Army-Navy Liquidation Board, the Organisation has compiled lists of surplus transport equipment. The repair of worn out and damaged transport is receiving special consideration; and British railway experts are being sent to France, Belgium, and Holland with four mobile workshops, which will demonstrate new methods of electric and acetylene welding. On the Belgian railways, energetic steps are being taken to make good the serious losses in locomotives and rolling stock; delivery of 2,000 vehicles ordered in Great Britain is in progress, while further large orders have been placed in Belgium and the United States. Upwards of 500 new locomotives are to be supplied from factories in Belgium and America. In Holland, passenger services are improving steadily. Two express trains are running daily in each direction between Amsterdam and Nijmegen; and the service between Utrecht and The Hague, via Gouda and Rotterdam, has been restored. With the cancellation of repatriation trains, passenger services have been resumed between The Hague and Amersfoort and Alkmaar.

Hardening of Crossing Rails

It has now become the standard practice with several British railways to harden the noses of rail-crossings before the crossings are assembled and laid in the track. Several methods of hardening are available, and of these the most popular is oil-quenching, which is probably the simplest and most foolproof of the various processes. Quenching in water has had a wide vogue, but the risk of this method, unless the quenching is followed by reheating and slow cooling, is that of the formation in the rail of transverse fissures. In all such nose-hardening, much of the value of the increased hardness is nullified by failure to harden the wing-rails at the same time. Indeed, it is open to question whether the battering of the wings is not accelerated as soon as the hardened nose, but little affected by wear, begins to stand up proud of the wing-rails; as a result, earlier attention is necessary by way of building up the wings with weld metal than would be the case if nose and wings were wearing down equally. The quenching of wing rails after they have been bent to the necessary angle at the knuckle is not easy, and distortion of the rails might take place if it were attempted; in that event, further bending operations would be necessary, with risk of fracture. Nevertheless, the most efficient results cannot be expected unless both nose and wings receive equal hardening treatment.

Permanent Way Experiments

Never before, in all probability, have so many experiments been proceeding simultaneously on British railway tracks as at the present time, and they are not merely experimental modifications of detail, but experiments which may effect radical changes in the track structure. Foremost among them, of course, is the experimental substitution of flat-bottom for bull-head rail, which has now reached the stage in which many miles of the former have been laid, with a great variety of fastenings. On the L.N.E.R. this experiment has gone further; single and double turnouts have now been laid in main lines with flat-bottom rail, and more complicated layouts are in preparation. Shortly all four main lines will have flat-bottom track in use, of either the 110 lb. B.S., the 131 lb. American, or a new 113 lb. per yd. section. Many further experiments are in progress with concrete sleepers in a variety of designs, in this case under a measure of compulsion through the shortage of timber; and for the same reason there is active enquiry once again as to the practicability of steel sleepers in British tracks, though this is a problem less easy of solution with the bull-head than the flat-bottom rail, and it is complicated by the corrosive influence of British climate and the wide use of track circuiting.

"Dieselising" A Railway

But little over ten years from the introduction to American railways of the first diesel-electric locomotives for long-distance operation, as compared merely with shunting and marshalling operations, a railway with 550 miles of line and a busy freight traffic is taking the initial steps to turn over its operation entirely from steam to diesel power. The New York, Ontario & Western—the railway in question—has about 550 miles of line, connecting Oswego, on Lake Ontario, with Weehawken, New Jersey (a part of New York Harbour), and serving also part of the anthracite-mining area around Scranton, Pennsylvania. It

owns 87 steam locomotives, of an average age of 30 years; and the first stage of the conversion is the purchase of four quadruple-unit and one twin-unit diesel-electric freight locomotives of 5,400 and 2,700 b.h.p. respectively, and the sale of some of the steam units. An important factor in inducing the change has been that the N.Y.O. & W. has no suitable locomotive coal on its own system, and carriage charges have therefore made steam operation unduly expensive. With an increase planned in the capacity of Oswego docks, abandonment of unprofitable branches and stations, "singling" part of the existing double main line with centralised traffic control, and the exclusive use of diesel power, it is hoped to convert a working deficit of \$2,947,253 in 1944 to a net profit of \$500,000 annually.

Standardisation of French Rolling Stock Details

When the French national railway system was formed, the rolling stock thus brought under a common management was very varied and necessitated the carrying of a large stock of numerous spare parts, which, in turn, increased the difficulties and cost of upkeep. About 54 per cent. of it was made up of types of vehicle designed by the seven constituent undertakings, 32 per cent. of stock obtained in the 1914 war, under orders given by the Ministry of Public Works, transferred to the railways by the American authorities, or ceded by Germany at the Armistice, and 14 per cent. comprised coaches and wagons built for the various lines to designs prepared by the Central Designs Office set up between them. Even among these groups there was considerable diversity, and it has been found necessary to take the matter in hand. An article by Monsieur Arnaud in the *Revue Générale des Chemins de fer* explains that a standard axle journal has now been agreed on, 4 types of complete axle—against 137—and 3 sizes of wheel, 3 ft. 0½ in., 3 ft. 3½ in., and 3 ft. 5½ in. dia. There are to be 15 classes of tyre, instead of 61, of which principal dimensions are identical. With the adoption of the standard journal it has proved possible to come down to 4 types of axle box, as compared with 76 formerly, and one type of brass and liner compared with 165, although here, as in other cases, a certain number of the older designs will have to be provided during a transition period. The detailed parts have also been greatly reduced in number.

Relay Interlocking in Switzerland

The extension of electric traction to the Busswil-Solothurn-Herzogenbuchsee line of the Swiss Federal Railways and the increased speeds contemplated on the section made it advisable to overhaul the signalling arrangements at 10 of the stations concerned and opportunity has been taken to introduce a number of modern methods of working. At Herzogenbuchsee, Inkwil, Subingen, and Busswil there were already mechanical signalling installations of recent construction and the colour-light signals, with which the entire route has been fitted, therefore, have been arranged to be controlled by the present levers. At Derendingen and Solothurn there is an electric central controlling frame, but for the other stations, Lüsslingen, Leuzigen, Arch, Biren, and Dotzigen originally fitted with crank-handle type locking frames on the platforms, a neat form of relay interlocking, operated by push-buttons placed below a track diagram, has been adopted, with electric operation of all points in the running roads and all signals. The equipment is described in the *Bulletin of the Swiss Federal Railways*, by Monsieur W. Schaffer, Divisional Signal Superintendent at Lucerne. For some time steady progress has been made in replacing the mechanical signals by colour lights all over the system, and no doubt the aim is to get rid of all wire transmissions in due course, a great advantage in winter.

Exchanges in U.S.A. Locomotive Designs

With a view to permitting economies in construction by reducing the number of different patterns and parts required, United States railways with increasing frequency are accepting the designs of other companies in their orders for new locomotives. For example, the Pennsylvania Railroad now has in service four times as many 2-10-4 locomotives of the standard Chesapeake & Ohio design as the C. & O. itself, and the Virginian Railway has recently purchased eight of the "Allegheny" type 2-6-6-6 locomotives of C. & O. design. Articulated locomotives of the Union Pacific's "Challenger" type, with the 4-6-6-4 wheel arrangement, are at work on the Denver & Rio Grande Western, and the Duluth, Missabe & Iron Range has in service a number of articulated locomotives of the Northern Pacific "Yellowstone" class. In most of these cases minor changes have been made to accord with the individual locomotive practice of the railways buying the new locomotives, but the basic features of design and dimensions remain unaltered. At present the New York Central System and the Texas & Pacific Railroad are enquiring for passenger locomotives of the 4-4-4-4 type, and it will be of interest to see if these companies favour the successful Pennsylvania "T1" design recently introduced.

Kenya & Uganda Railways & Harbours

THE services operated by the Administration of the Kenya & Uganda Railways & Harbours consist of 1,625 miles of open lines (metre gauge), 2,280 route miles of steamer services, 75 miles of road motor transport (exclusive of motor feeder services) and 128 stations. In the report for the year 1944, which we have received from Sir Reginald E. Robins, the General Manager, it is shown that the combined earnings from all services amounted to £4,752,835, an increase of £312,482. Ordinary working expenditure, exclusive of renewals, was £2,840,003, an advance of £337,220. The net earnings balance of £1,690,614 over total expenditure on revenue account is equal to a return of 6.97 per cent. on the total capital expenditure of £24,255,938 and the surplus for 1944 over loan charges is £821,027. Comparative results of the railway services (inclusive of lake steamers and motor road transport but exclusive of harbour services) are shown in the accompanying table:—

	1943	1944
Passengers	2,758,757	2,768,767
Paying goods, tons	2,075,769	2,169,731
Revenue train-miles	3,519,086	3,887,668
Paying goods, ton-miles	497,576,926	569,091,208
Operating ratio, per cent. (excluding renewals)	57.75	61.14
Average haul, miles	243	271
Passenger receipts	£ 761,101	£ 762,468
Paying goods receipts	2,669,965	2,984,515
Gross earnings	3,679,412	4,004,772
Working expenditure	2,124,644	2,448,367
To renewal funds	375,790	374,526
Miscellaneous transactions, net	Cr. 155,529	Cr. 180,831
Net revenue	1,334,507	1,362,710
Loan charges, etc.	643,786	643,928
Surplus	690,721	718,782

The outstanding feature of the year's operation was a reversal of many of the principal trends in traffic which had prevailed since the beginning of the war. The average haul, which had declined steadily since 1939, rose sharply. This was due to a change in the nature of the traffic handled. The heavier Uganda cotton crop traffic with its long haul of some 800 miles had a significant effect in increased ton-mileage, which in turn favourably affected other operating statistics. The operating situation was eased somewhat during the year by the arrival of seven Beyer-Garratt locomotives, 320 goods wagons and 38 cattle trucks. Wagon mobility has been the keynote of the success achieved by the Administration in solving its wartime transport problems. An improvement in the average wagon load per 12-ton unit was due to a change in the nature of the traffic carried enabling an increased tonnage to be moved with fewer wagon journeys. Increased average mileage per wagon per day was made possible by the lengthening average haul. In the average net train load, which reached 180 tons, the improvement was due to an increased ton-mileage being hauled with a disproportionate increase in train mileage. Better wagon loading helped to achieve this satisfactory result. In locomotive running there was an increase in fuel consumption, the principal causes of which were the large number of engine failures and time lost *en route*; inexperienced African drivers, and particularly firemen; many engines running beyond their economic repair limits causing them to be heavy on coal; and a certain amount of inferior coal.

In his summing-up of the general position, Sir Reginald Robins warns all users that the present position cannot continue indefinitely. Equipment is unequal to the demands, it is rapidly wearing out, materials to maintain it are difficult to obtain. Much more serious is the question of the staff. The majority of the staff both, senior and junior, have been called upon for five years (some much more) to work long hours and to meet unprecedented difficulties. They have had very limited facilities for either local or overseas leave. Some relief could be obtained by the appointment of additional trained staff. Up to now all attempts in this direction have met with so little success that it has been impossible to cover staff wastage.

The present financial position of the Administration presents an entirely false picture. The creation of surpluses is, in the main, due to the inability to utilise funds to keep it as a well-equipped, efficient organisation. The amount set aside for renewals is based on a percentage of replacement costs of the various assets, and falls short of the amount required to replace them at the end of their normal lives by approximately £50,000 per annum. Further, these replacement costs are based on pre-war costs. The lives of assets were also calculated on normal lives, but during the war most of these assets

have been subjected to abnormal wear and tear and their lives thereby shortened. There are also other heavy financial commitments for the future. The introduction of large engines and heavy and long trains has made it imperative to replace the present type of coupling and to effect improvements and alterations in the braking system if the standard of safety is to be maintained. These two items involve large sums and present a difficult problem of organisation to effect the changes. It would also be unwise to assume that the present level of revenue is likely to be maintained indefinitely. The present surpluses are therefore, to a considerable extent, fictitious.

Nationalisation Rumours in Argentina

IT requires little incentive now-a-days to revive rumours that the British-owned Argentine railways are about to be taken over by the State. Recently, a representative of the Ministry of Food went to Buenos Aires to negotiate an agreement under which the British Government would purchase meat to the value of £150 to £200 million for delivery during the next five years. Shortly after he had sailed for England on the completion of his mission a press report published in London announced that plans for the purchase of the British-owned railways had been reported from Buenos Aires. At the same time, it was suggested that the sale of the lines might be linked with payments under the impending 5-year meat contract and also with the use of the blocked sterling balance in London standing to the credit of the Argentine Government. Sir Montague Eddy, the Chairman of the Buenos Ayres Great Southern and Buenos Ayres Western Railway companies, who is on a visit to the River Plate, promptly issued a statement to the press in which he denied the report regarding a plan for the purchase of the railways and added: "There have been no pourparlers of any kind, neither have we up to the present been approached with any such object in view." In our last week's issue we recorded a report of a speech made by Sir David Kelly, the British Ambassador to Argentina, in which he spoke bluntly of the need for a new deal for the railways.

Throughout the war, purchases of Argentine meat by Great Britain proceeded on an even greater scale than in peacetime, chiefly because of the intensive demands of the armies in the field. Exports from Great Britain diminished steadily until, at the close of hostilities, they had practically reached vanishing point. In consequence, payments for meat and other produce shipped from Argentina had to be restricted to the cash proceeds from the sale of investments, mostly Argentine Government sterling bonds and holdings of Argentine National Mortgage Bank bonds and other peso securities held by private investors in the British Isles which were requisitioned by the British Government in the process of mobilising the nation's financial resources.

Payment for purchases which could not be met out of the proceeds of liquidated investments had to be deferred and at present Great Britain owes Argentina about £100,000,000. The revival of exports and the resumption of earnings of British ships operating in the River Plate trade together may balance the cost of current imports of meat and other Argentine produce, but there is no immediate indication that there will be a surplus of exports, visible and invisible, over imports of sufficient magnitude to enable the debt of £100,000,000 to be reduced appreciably. Perhaps more than any other motive, this debt is the cause of rumours of an impending deal under which Great Britain's liability would be discharged by the transfer of the British-owned railway systems to the Argentine Government and, more recently, such anticipations have been strengthened by the knowledge that valuable concessions under the Mitre Law will lapse at the end of next year, and the view is held generally that the government will prefer nationalisation to the renewal of concessions to private enterprise. In this connection, the return of a Labour Government to power in Great Britain in favour of State ownership of inland transport is not likely to have been overlooked in Argentina, and in no way facilitates the efforts of the British-owned companies to obtain the renewal of Mitre Law concessions, which expire on January 1, 1947.

Apart from inter-governmental finance, there is another factor of great weight which may well expedite State ownership of Argentine railways. For a long time, the economic status of the companies has been far from satisfactory and the reserves at their disposal are inadequate to meet the heavy arrears of renewals work. Moreover, it is many years since capital has been raised for the execution of much-needed improvements and modernisation schemes. With the best of the long-term debenture stocks quoted little higher than £60,

and all the preference and ordinary shares well below that figure, there is little possibility of raising fresh capital. Consequently, although British manufacturers of rolling stock and other railway supplies will soon be in a position to resume large-scale shipments, exports of capital and renewal equipment necessarily will be restricted until the important problem of financing them has been solved.

If the railways were State-owned, it is argued, the credit of the Argentine Government would be more than adequate to ensure an ample flow of funds to pay for the equipment which British manufacturers will be able to allocate to Argentina. Furthermore, without the removal of the financial obstacles which now stand in the path of the free resumption of British imports of railway material into Argentina, it is difficult to discern by what means the heavy meat, grain, and other shipments to Great Britain can be paid for. It is still more difficult to visualise ways and means of liquidating the £100,000,000 of blocked sterling balances standing in London to the credit of the Argentine government, other than by the sale of investments, of which the railways are the most important. It is for these reasons that many expect the railways to be the basis of a deal between the two countries.

Welded Locomotive Boilers in America

IN view of the increasing interest shown in welded boilers for locomotives, especially since the arrival of Mr. Bulleid's "Merchant Navy" 4-6-2s on the Southern Railway, it is useful to consider what progress this new and highly specialised art is making across the Atlantic. It is a remarkable fact that although several hundred locomotive boilers in the U.S.A. have welded longitudinal seams in each of the rings or "courses" in the boiler barrel, there is as yet only one completely welded locomotive boiler, namely that used on a certain 2-8-0 freight locomotive on the Delaware & Hudson Railroad. In view of Mr. Bulleid's enterprise, therefore, this country can be considered as having far outstripped American practice in that respect, since in the "Merchant Navy" class, welding is extended to certain firebox seams also. The Delaware & Hudson boiler has been in highly successful service for 6½ years, during which time no shell repairs have been necessary.

Welded construction for locomotive boilers has had a curious and complicated history in the U.S.A., and this is reviewed briefly in an article by Mr. James Partington, the Manager of the Engineering Department of the American Locomotive Company, in our American contemporary, the *Railway Age*. Beginning with early attempts, from about 1910 onwards, to effect certain boiler repairs by welding, the attempt was next made to butt-weld fireboxes in new boilers, first by oxy-acetylene and later by electric arc welding, using bare-wire electrodes.

Efforts were also made to repair boiler shells by electric welding; these welds were not stress-relieved, and would not have passed present-day specifications. "They were generally unsatisfactory," states Mr. Partington; "and new cracks soon developed when the locomotives were put back into service." Eventually the Interstate Commerce Commission, through its Bureau of Locomotive Inspection forbade the welding of all pressure parts of locomotive boilers, and allowed only the stayed portions of fireboxes to be welded, stipulating also that welds were not permitted within 14 in. of the top of the crown sheet.

In 1918 the National Welding Council, now affiliated to the American Society of Mechanical Engineers, through its Boiler Code Committee, appointed a Sub-committee on Welding which drafted safety rules for welding practice. Two years later the Committee asked the American Welding Society to co-operate in laying down comprehensive welding rules. This formidable task took several years to complete, but in 1925 the first edition appeared of the Code for Unfired Pressure Vessels. Additions to this code were made in 1931 and 1942 to cover power boilers and locomotive boilers respectively.

The Delaware & Hudson experiment was allowed by special permission of the Bureau of Locomotive Inspection and was built in accordance with the A.S.M.E. Boiler Code for Power Boilers, as the code for locomotive boilers then had not been formulated. It was stipulated that before going into service on the engine it should be kept in use for six weeks as a stationary boiler; and this was done. In its first year on the locomotive it was examined every three months, and since then six-monthly inspections have taken place. It is stated to be absolutely free from any leaks.

The chief advantages of welded locomotive boilers, as given by Mr. Partington, are:—

- (1) The elimination of riveted joints.
- (2) Removal of the possibility of cracked sheets, by elimination of leaks.
- (3) More satisfactory application of boiler lagging and jacket, due to smooth contour of welded boiler.
- (4) Saving in weight—this may be 3,000-6,000 lb. in boiler alone.
- (5) Saving in maintenance costs.

Mr. Partington's five hints for success in welding locomotive boilers are:—

- (a) Insistence on all shop technique, equipment, and material meeting fully the requirements of the Code.
- (b) The employment of properly qualified welders.
- (c) X-ray examination of the welds, to reveal soundness, and freedom both from slag inclusions and also from porosity.
- (d) Stress-relieving must be carried out in a properly controlled furnace.
- (e) A hydrostatic test to a pressure $1\frac{1}{2}$ times that of the working pressure should be conducted, during which the welds should be subjected to a hammer test.

Several improvements in welding technique, and in the design of the welded joints have been made since the Delaware & Hudson boiler was built, for example, the method of attaching the dome to the barrel. These steps forward can be incorporated in future boilers of this type. It is thought that riveting will not disappear suddenly from locomotive boiler construction, but that there will be a gradual transition to the use of welded boilers, as the number of present-day problems which could be solved by their adoption becomes more fully appreciated. In the meantime, it is much to be hoped that further progress will be made on this side of the Atlantic, and that Mr. Bulleid (who was closely associated with the first L.N.E.R. locomotive to have a welded boiler barrel, while he was still with that company) will tell us something about the behaviour and maintenance of his "Merchant Navy" boilers.

Tourist Traffic—A National Asset

IN the course of the past hundred years, the subject of tourists and touring has been discussed from many points of view. A profusion of guide-books, brochures, and personal records of journeys has told the traveller what to see, how to go, where to stay, and what his journey will cost him. This wealth of publicity has born increasingly good fruit, especially in the period between the two world wars, when the volume of tourist traffic in many countries assumed the proportions of a national asset.

It has fallen, however, to a distinguished scholar and economist to approach the subject from a new angle. In a concise, but comprehensive work,* the study of the tourist movement has been developed into an exact science, and the value of the tourist as an economic asset has been fully assessed. As a basis for calculation, the tourist is clearly defined as one who leaves his home for a period not exceeding one year, and who spends money in the places he visits without earning it from local employment. All others are considered as migrants, who have changed permanently their place of residence. The term tourist therefore acquires a wider meaning, and includes many types of traveller, in addition to holiday-makers.

It is to be regretted that most countries do not possess sufficiently complete records to enable a detailed investigation of their tourist traffic to be undertaken solely from official statistics. Nevertheless, either directly or by means of well-founded deductions, and relatively simple calculations, the data available yield results that are worthy of close study. Not only can the number, nationality, and average length of stay of visitors be determined with considerable accuracy, but in certain countries, an estimate may be formed of the amount of money the tourist is likely to spend, and the ways in which he will spend it. These latter figures are frequently illuminating. In the United States and Canada, for example, it was computed, in 1930, that the average tourist expended almost 38 per cent. of his money on hotel accommodation, and meals in restaurants and cafés; 26 per cent. on merchandise; and rather more than 10 per cent. on transport (including trams and taxis). It must, however, be borne in mind that a direct application of these proportions to many other countries would probably be vitiated by the fact that the average North American tourist is comparatively well-to-do, and therefore able to afford

a considerable margin of expenditure after providing for the prime necessities of accommodation, food and transport.

It remains to be seen how quickly the world will recover from the prolonged crisis of war through which it has just passed. In most European countries, at any rate, some considerable time must elapse before visitors can be received on a large scale. It is to be hoped that the final stages of recovery will be expedited, and subsequent prosperity maintained, by encouraging tourist traffic to the utmost, and that the problem will be solved on sound economic lines, and not by old-fashioned haphazard methods.

The Importance of Being Consistent

THE publicity value of a distinctive symbol, usually in association with a name or initials, has long been realised by many leading transport concerns. One of the best examples is the bar and circle device of the London Passenger Transport Board, which has been used consistently on rolling stock, signs, posters, and other advertising material for many years, and is now so familiar to Londoners that it is often displayed without any lettering at all.

More important than the symbol, however, is the way in which the title of the company is depicted. Here again the practice of the London Passenger Transport Board may be cited. A title of this length is too much of a mouthful for the public to swallow and the alternative "L.P.T.B.," although euphonious to some extent, is made visually ugly by the terminating "B." So "London Transport" was adopted for all general purposes and it was undoubtedly a wise choice.

A similar problem earlier had faced the London Midland & Scottish Railway. In this case the abbreviation "L.M. & S.R." was neither euphonious nor visually pleasing, but what a difference was made by dropping the ampersand and the "R"! The invariable use of "L.M.S." on locomotives and rolling stock of all kinds, signs, advertising material, and so forth undoubtedly has made the abbreviation as widely known and understood as "L.N.E.R.," "B.B.C.," or "I.C.I." The L.M.S.R. obviously was determined not to perpetuate the eccentric inconsistencies of one of its predecessors, the London & North Western, which variously displayed "L.N.W.R.," "L. & N.W.R.," "L.N.W. Rly.," "L. & N.W. Rly.," and other permutations.

It is undeniable that had the London & North Eastern emulated the London Midland & Scottish by dropping the "R" in its abbreviated title the result would not have been the same. Certainly the ampersand had to go; either "L. & N.E.R." or "L. & N.E." looked and sounded dreadful. And "L.N.E." was no better; in combination with the letters that precede it the terminating "E" appeared unfinished and it was undoubtedly an excellent decision to standardise upon "L.N.E.R.," which is both easy on the eye and the ear.

This abbreviation has been used consistently to good effect by the London & North Eastern Railway to the outbreak of war, except in the case of wagons, which have always been lettered "N.E.," an unnatural abbreviation which was extended to locomotives and passenger stock as an economy measure during the war. It is to be hoped that the familiar "L.N.E.R.," perhaps in association with the company's distinctive "totem," will soon be restored on all locomotives and rolling stock, including wagons, which at present display "N.E." on the bodies, "L.N.E.R." on the sole bars and "L.N.E." on the axleboxes.

DECLINING U.S. RAILWAY REVENUE.—Figures published by the Bureau of Railway Economics, A.A.R., stress the decline in United States net railway revenue which is being brought about by progressively increasing costs of labour and materials, and the rapid rise of taxation. From 1939 to 1944, gross revenues have increased each year; in millions of dollars, the totals rose from 3,995 in 1939 to 5,347 in 1941; the previous peak of 6,280 in 1929 was surpassed in 1942 with a total of 7,466, and by 1944 the remarkable figure of \$9,437,000,000 had been reached. But net operating income, in millions of dollars, after growing from 589 in 1939 to 1,485 in 1942 (an increase in return on capital from 2.25 to 5.50 per cent.), declined to 1,360 in 1943, and further to \$1,106,000,000, or only 4.0 per cent. return, in 1944. In the peak year 1929, net railway operating income was \$1,252,000,000 and the return averaged 4.81 per cent. The net income, after deduction of all charges, in millions of dollars, in 1929 was 897; ten years later it was 93. The years 1940, 1941, and 1942 saw increases to 189, 500, and 902 respectively. There was a fall to 873 in 1943, and to 668 in 1944.

* The Tourist Movement. By Sir F. W. Ogilvie, M.A., LL.D. London: Staples Press Ltd., Cavendish Place, S.W.1. 9½ in. x 5½ in. 228 pp. Price 14s.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Bank Holidays a Nuisance

London, N.W.

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I agree with your view that Bank Holidays are a nuisance now that most people have at least a week's paid leave a year. Things were different in Lubbock's time, when hours were long and work continuous.

Yours faithfully,

CIVIS

Indian versus American Railway Efficiency

London, N.W. September 9

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In his letter in your issue of September 7, an Indian railwayman bases his assertion that Indian railwaymen can be the most efficient in the world on a solitary statistic. Before he can compare the performance of the Bombay, Baroda and Central India Railway with the operating results of an American railway in wartime, he must set out, for both, complete details such as:—

1. The route miles worked.
2. The net ton mileage.
3. The density of traffic.
4. The ton miles worked per train hour.
5. The train and wagon load.
6. The freight locomotive miles per day.
7. The average freight train speed.

As numerous articles in *The Railway Gazette* have shown, all these figures and many more are available for the individual American railways during the war years. One hopes that your correspondent is correct about the high state of efficiency reached in India, but he cannot prove his claim unless he gives the whole picture.

All this will be obvious to you, but it is strange how loosely figures are used. By selecting one statistic only it would be possible to prove that the Pennsylvania was the worst of the great American railways—which is absurd.

Yours, etc.,

STATISTICIAN

"N or M"

"Fraithwen," Pool Quay, Welshpool,
Montgomeryshire. September 8

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—On reading the correspondence of locomotive enthusiasts concerning the nomenclature of railway engines, I have been asking myself: "What is the real object of giving locomotives names?" Who started it—was it Stephenson with the *Rocket*, and, if so, I wonder if he had the same views as Major Robins when he chose this name, although William Hedley's *Puffing Billy* sounds nearer to those views and more realistic?

Obviously, both Stephenson and Hedley, by choosing these names, did so with the object of conveying to the public in an attractive and fanciful way a new idea for locomotion based on the power, speed and movement of things already known, such as fireworks and old gentlemen. In effect, they advertised the arrival of a new era of transportation in such a way as to tickle the palate of the public with curiosity; and that is the essence of good advertising.

Now if, as Major Robins suggests, the locomotives of today are to establish individual hall-marks indicating some qualifying degree of power, speed and movement, by names flavoured with the "Rocket-Puffing Billy" essence, then I certainly agree with Mr. Heney that some very serious thinking must be done before one can arrive at suitable names capable of conveying to the man-in-the-street a profound distinction between the slim, slinky, slender, elegant lady-like looking locomotives evolved by draughtsmen imbued with a love for aesthetics and the Falstaffian, gargantuan masculine-looking mastodons poured out from blueprints like ingots of pig-iron.

Most of the mastodons now appearing on English railways are, to my mind, speaking purely from an æsthetic point of view, mind you, hideous monstrosities unworthy of names at all. The latest type which the Southern Railway proposes to employ on the railways running through the beautiful counties of the west is, well—as I am a Devonshire man myself, perhaps it would be better if I said naught. The only thing I pray is that in choosing their names for these—I nearly slipped up—the Southern Railway will avoid anything that smacks of the west—Raleigh, Drake, Grenville, and the rest.

It is difficult to understand the reason for these monstrosities on our home railways when so many powerful locomotives with beautiful lines are being built by English and Scottish engineers in Great Britain for the railways in India, Australia, New Zealand,

Iraq, and elsewhere, locomotives which really are worthy of names, grand names such as *Emperor of India*, *Star of the East*, *Southern Cross*, and *Maori Chief*. Names like these, of course, hardly fit in with Major Robins' ideas of suitable locomotive nomenclature, although I imagine *Toot Sweet*, recently illustrated in *The Railway Gazette*, would have his approval.

But to come back to the point: as names for locomotives have been accepted by custom, why not give them Empire names (list below for a start). After all, who are the greatest and most numerous of our locomotive enthusiasts in this country? The schoolboys, and thousands of laymen (not railwaymen) out of their teens, even old jossers like myself. I love locomotives, and although I am able in a great measure to appreciate their qualities from an engineering point of view, I also have a decided bent for the aesthetics of locomotive construction. I, also, as a traveller of the world, have a great love for the Empire, and anything which brings the Empire nearer to our young people in these islands must be fostered and encouraged. I can conceive few better means of bringing the names of states and provinces, cities, great rivers and lakes, as well as native peoples, in our dominions and colonies to the notice of our rising generation than by putting them on our locomotives. When our lads in North Africa, Italy and France chalked "Lizzie Annie" and "Laburnum Cottage" on their tanks, it was not to signify the power and speed of their vehicle, but to show that somebody's sweetheart and somebody's little nest at home was not forgotten. Every time somebody looked at those chalked names it set him thinking; and that is what we want our youngsters to do and what they surely will do when they see such names on our locomotives as *Ontario*, *Saskatchewan*, *Manitoba*, *Vancouver*, *Queensland*, *Tasmania*, *Zambesi*, *Murrumbidgee*, *Malabe*, *Auckland*, *Dunedin*, *Bulawayo*, *Kenya*, *Nyasaland*, *Zululand*, *Swaziland*, names which will excite curiosity and invite an early reference to the map of the Empire.

Yours faithfully,

ARTHUR CHICHESTER

G.W.R. Oil-Burning Locomotives

September 14

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—It is interesting to learn, on page 275 of your September 14 issue, that the new oil-burning apparatus fitted to certain Great Western Railway freight locomotives will enable a saving of 70 lb. of coal per mile to be effected. The figure of coal consumption is interesting in itself; and it leads to the reflection that for every week of many past years the 6,400 coal-burning locomotives of the L.N.E.R. have saved the country many thousands of tons of imported oil fuel!

Yours faithfully,

ECONOMIST

Alternatives for "Enthusiast"

9, Keble House, Manor Fields,
Putney, S.W.15. September 15

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I must join issue with your latest correspondent. His resonant and polysyllabic synonym "Cheminologist" is, in my opinion, a threefold "flop."

In the first place it might be mistaken for a keen student of ladies' underwear; secondly, his road is a good one as far as it goes, but lacks that vitalising constituent, iron; thirdly and lastly, the word is, I submit, a distasteful Greco-French hybrid.

A truce to these "out-of-gauge" neologisms!

My designation of one bitten by the railway bug is short, sweet and snappy—"loco."—and to those who have lived in Spanish-speaking countries I think I need say no more.

Yours faithfully,

J. E. L. SKELTON

London-Dover Boat Trains

Northwood, Middlesex. September 8

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The interesting note on page 234 of your issue of September 7 shows the gradual improvement in the speed of the boat trains before the European war of 1914. By August, 1914, the "Afternoon Continental Boat Express," part of the much-advertised "London to Paris in 6½ hours" service, was booked to run from Charing Cross to Dover Pier in 90 minutes. No up train was timed so well; the best was 105 minutes from Dover Pier to Victoria, though Folkestone Pier to Charing Cross was done by one train in 100 minutes.

Skipping fifteen years we find that in the autumn of 1929 the best timing from Victoria to Dover Marine was 98 minutes, but this applied also to the up run. By 1939 the schedule, it is stated on page 252 of *The Railway Gazette* of September 7, had been improved to 90 minutes, but this had been the timing of one of the boat

trains on the down journey as far back as 1913-14, so an improvement may be expected soon.

It may be of historical interest to refer to the South Eastern Railway's advertisement in *The Times* of August 14, 1844, headed "London to France and Belgium," referring to the train which was running on weekdays and Sundays from Bricklayers Arms Station every morning at half past five. This train had been put on in connection with the boat leaving Dover on Sundays and Thursdays for Ostend, and with boats leaving Folkestone twice a day for Boulogne. It commenced to run early in August and may be considered as the first of the boat trains. Leaving Bricklayers Arms at 5.30 a.m., it called at Reigate, Tunbridge, Ashford and Folkestone, and was due at Dover at 8.30 a.m. The boat left at 9 a.m. A few months earlier, on June 3, the company ran a special train to take the Queen Dowager from London to Dover. The engine was *The Maid of Kent*, and Benjamin Cubitt was on the footplate—the time taken was 2½ hours only.

Yours faithfully,

REGINALD B. FELLOWS

"Consecutive Number" Stations

"Ventnor," Kilworth Avenue, Shenfield,
Essex. September 7

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The recent correspondence on this subject prompts me to forward the following riddle, for which I am indebted to a Southern Railway season-ticket holder:

Question: What is the greatest distance between two consecutive bridges in Great Britain?

Answer: 430 miles (approximately), because when coming from Brighton you pass Three Bridges in Sussex, and do not reach the Forth Bridge till you get to Scotland!

Your faithfully,

D. C. PLYER

146, Marlborough Road,
Romford, Essex. August 24.

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I beg to submit a further list of "consecutive-number"

stations:—			
One Mile ...	Queensland.	Six Mile Bottom ...	Cambs.
Wonerah ...	Surrey.	Six Mile Cross ...	Clare.
Two Mile Bottom Siding ...	Norfolk.	Seven Kings ...	Tyrone.
Two Pot House Siding ...	Cork.	Seven Sisters ...	Essex.
Three Bridges ...	Sussex.	Sevenoaks ...	Middlesex.
Three Cocks Junction ...	Brecon.	Seven Stars ...	Kent.
Three Counties ...	Beds.	Eight Mile ...	Montgomery.
Three Crows Siding ...	Glam.	Eighton Bank ...	Missouri.
Three Horse Shoes ...	Cambs.	Nine Elms ...	Durham.
Four Crosses ...	Montgomery.	Nine Mile Point ...	Surrey.
Four Ashes ...	Staffs.	Ten Mile Bottom ...	Pennsylvania.
Four Oaks ...	Warwick.	Tenby ...	Pembroke.
Fourstones ...	Northumber-	Leven ...	Fife.
Five Mile House ...	land.	Twelve Corners ...	Wisconsin.
Five Ways ...	Lincs.	Twenty ...	Norfolk.
	Warwick.		

Yours faithfully,

H. BYGRAVE

The L.B.S.C.R. Fight to Retain South Coast Traffic

Hurstpierpoint,
Sussex. September 5

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The September and October issues of your associate periodical *The Railway Magazine*, contains an article "Tunbridge Wells: An Important Strategic Point," and stress is laid on the unceasing efforts of the L.B.S.C.R. to deny entry to the South Coast towns to the S.E.R. Despite liberal concessions the former company was not altogether successful. In 1897 the S.E.R., through a subsidiary, the Crowhurst, Sidley & Bexhill Railway, obtained powers to construct a railway from the Hastings branch, two miles south of Battle, to Bexhill.

Whatever may have been the practice of the S.E.R. previously as to the cost of stations and works on the new branch, it went to the other extreme. A substantial station was erected close to the hamlet of Crowhurst, on the excellent S.E.R. plan with four lines, the through in the centre, and a platform on each side. In addition to the station, a substantial house for the stationmaster and a hotel were built adjacent to the station. The hotel cost about £5,000, apart from the furnishing and equipment.

The construction of the double-line branch, about 4½ miles long, proved to be so expensive that had the difficulties and consequent additional outlay been foreseen, it is not unlikely that the branch would not have been made.

Crowhurst Junction is 126 ft. higher than Bexhill terminus: a short distance from the junction the line falls at 1 in 90 for about ½ mile, then for about 1½ miles at 1 in 100. Here the imposing Crowhurst Viaduct commences; the line is level for about ¾ mile.

The viaduct consists of 17 arches; rail level is 67 ft. above ground at the lowest level.

I have not before me the amount of authorised capital of the C.S.B.R. Probably it was about £150,000, with the usual borrowing powers. But it was soon evident the soil was not as solid as was assumed by the engineer, and to complete the line the S.E.R. obtained a supplementary Act increasing the capital by £100,000.

The erection of the viaduct was commenced in December, 1898, but no solid foundation for the piers could be obtained. Finally huge concrete blocks—one, possibly more, measuring 52 ft. x 30 ft. and 32 ft. thick—were sunk. The total height, foundation bottom to top of parapet, is 111 ft. When the secure foundations for the viaduct had enabled it to be built, the approach embankments at both ends—like the historic railway line across Chat Moss—refused to be consolidated. Much time elapsed before they were made sufficiently firm for trains to run over them.

The branch was opened on June 1, 1902, with an intermediate station at Sidley, having taken 4½ years to construct. Distance from London is 62 miles, 9 miles less than by L.B.S.C.R. route. The S.E.R. expected the saving in distance would enable the traffic to pay working expenses, and possibly something over towards interest on capital. There was an up morning through express to Cannon Street allowed 1 hr. 39 min., calling at Sidley, Robertsbridge for Kent & East Sussex line connection, and Tunbridge Wells. The through train from Cannon Street was in the evening.

Several trains up and down had through carriages to and from London. The branch service, at one period, was provided by push and pull, or railcar trains, if my memory serves me correctly.

The branch was closed during the 1914-18 war, save for an occasional goods, coal, or military train. When I visited it in August, 1918, the S.E.R. was displaying an unusual degree of enterprise. On Tuesdays and Fridays an excursion train was run to Battle, in the morning from Bexhill and Sidley; returning in the evening. This gave the patrons very ample leisure to visit the famous Battle Abbey. The service was empty from Crowhurst to Bexhill, returning immediately with passengers to Battle. The evening train called at Crowhurst in addition to Sidley on the return trip.

The train consisted of a S.E.R. bogie picnic saloon, weighing 26 tons, and a four-wheel third class brake coach, with three compartments, lettered on the side frame "Folkestone Harbour Branch." On my visit the engine was No. 101, 4-4-0 type, with 7-ft. coupled wheels. At this time, in a siding at Sidley, was a small S.E.R. locomotive, heavily encased in tallow; it appeared to have been exposed to the weather for a considerable time.

In cases where competing lines have different mileage, the shorter route usually fixes the fare for both. The London-Hastings S.E.R. mileage is less than the L.B.S.C.R. but Bexhill by both railways is less distance than Hastings, but not sufficient to be less than the S.E.R. London-Hastings fare, which therefore governs the L.B.S.C.R. London-Bexhill fare.

The latter line, however, has a considerable local traffic—Hastings, Eastbourne, Brighton, and Lewes—but the S.E.R. has none. So in 1902, despite the various expensive but unremunerative lines the L.B.S.C.R. had constructed to protect its monopoly of the South Coast traffic, and the Danegeld paid to the S.E.R. for the same purpose, the latter reached the South Coast at Bexhill.

It is of interest to note that the S.E.R. some 17 years before it had a station named Crowhurst, had Crowhurst north and south junctions, connecting its old main-line near Edenbridge with the Croydon & Oxted Joint (S.E. & L.B.S.C.) line near Oxted, but about 40 miles north-west of Crowhurst Station.

Yours faithfully,

G. A. SEKON

Modern Coach Design

Cambridge. September 9

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—You do not give the weight of the L.M.S.R. 3rd class coach, described on page 245 of your September 7 issue, but it is better than the L.N.E.R. new standard, carrying 56 instead of 42 passengers. It should be possible to seat 60 people in a modern vehicle and it is a question whether bucket seats are not better than the old fashioned pews. Many people like the separate chair in the L.N.E.R. end-door thirds, though its design might be improved. That arrangement has the advantage that each passenger has an independent seat and cannot be squeezed by a stout or aggressive neighbour. With the bucket seats passengers entering can also see quickly when chairs are empty.

It is disappointing to passengers, who are also students of transport economics, to find that the railways are unable to agree upon common standards. Their failure to do so at this stage of uncertainty gives an opening to people who see advantage in uniformity under State ownership.

Yours, etc.,

EAST ANGLIAN

The Scrap Heap

DEMobilISATION

It is now clear that the speed of the whole process is being left to the military, with the results that might have been expected, for if the British Army has one quite peculiar skill, it is that of conducting a stubborn retreat without losing a single unnecessary man.—From "The Economist."

2,000,000 CUPS A YEAR LOST ON RAILWAYS.

Over 2,000,000 cups were broken or lost on the railways each year before the outbreak of hostilities. With the increased passenger traffic now experienced, replacements are insufficient to meet requirements. Chief cause of loss and damage is the cups of tea taken on to trains. In addition to losses, cups taken on trains are out of use for long hours when they might be used over and over again at a refreshment room. Service of cups of tea for consumption on trains has already been curtailed and it may have to be stopped altogether.

100 YEARS AGO

From THE RAILWAY TIMES, Sept. 20, 1845.

TO THE EDITOR OF THE RAILWAY TIMES.—Sir, I see by an advertisement in your journal, that the London and Birmingham Railway Company think it necessary to inform the public, "that they have no connections with the proposed line announced as the London and Birmingham Extension, and that the London and Kidderminster line in connection with the London and Birmingham line, is in their opinion best adapted for the accommodation of the public." Now (as I believe that the Birmingham Extension have never courted the honour of a connection with the said Company), are we to infer that no line, however meritorious in the eyes of the public can possibly succeed unless protected by their all powerful influence? or that because they have a line of their own they are to monopolise all others? Such may be the opinions of the Managers of the London and Birmingham Company, but they are not likely to succeed in pulling the public into a similar belief, or in preventing their support to a scheme which has met with such deserved and general approval as the London and Birmingham Extension, they would therefore do well to quiet the jealous feelings which their advertisement displays.—Your obediently,
FAIR PLAY.

RAILROAD NOISES

We have always resented those snooty expressions, "across the tracks" or "down by the tracks," with their implication that there was something disreputable and socially low-life about living near railroad tracks.

Where is there a more romantic place than the right of way, with wheezing switch engines, puffing freights (which travel so much faster now than they used to) and speeding passenger trains? Morning, noon and night railroading holds attraction for a boy, which is why so many of them go into it, finding a romance which never dulls until they die.

Far from being bothered by the noises, you get so you find them soothing and conducive to repose. You get so you can tell the freight trains from the passengers, and you distinguish the touch on the whistle rope of that individualistic engineer who makes his blasts so short, sharp and distinctive.

Back a few years, when trucks and buses started to cut more and more deeply into railroad revenues, with the airplane as an additional competitor just ahead, as a boy living near the tracks you may have wondered a little worriedly if they would put your old friends, the freights and passengers, out of business. It took the war to show that a nation's need of railroads continues, that no nation can be great and strong without them. You are reassured by that, and by the articles and drawings that have been published of vastly improved equipment which will help the railroads get their share of

traffic after the war. Such things mean your friends will be able to stay alive and that, drowsily safe and comfortable, you will continue to hear the trains chugging and puffing through the night.—Extracts from an editorial in the San Jose, California, "Evening News," and reproduced as an advertisement by the Southern Pacific.

RAILWAY QUESTIONS AND ANSWERS

Statement: The railways have shown so few signs of progress and initiative in the last sixty years, that the public would be bound to gain in efficiency, even if not financially, under State-ownership.

Answer: The "few signs of progress and initiative" shown by British railways in the past 60 years are as follows:—British railways have become the largest dock owners; the largest hotel owners; and the largest owners of freight road vehicles in Great Britain. British railways hold the world's record for steam train speeds (The Mallard, 125 m.p.h.); set up and maintained the world's longest non-stop runs, Kings Cross to Edinburgh (392½ miles), during the summer; Carlisle to Euston (299 miles) all the year round, and set up the world's fastest regular steam train record (the "Coronation" with an average start-to-stop speed, London and York, 71·9 m.p.h.). British railways have established and maintained the world's largest suburban electric train service. British railways have built the world's largest covered goods station (Bristol, Temple Meads), and Europe's largest group of sorting sidings (Whitemoor, Cambs.). On British railways density of traffic (measured by train miles per mile of line) has become nearly double that of France or Germany before the war; five times the density of rail traffic in the United States. British railways have introduced streamlined expresses, streamlined heavy oil rail-cars for local passenger services and increased speed of freight services to allow "next day" deliveries. British railways introduced monthly return tickets, tourist tickets, cheap-day tickets, half-day or evening excursions, and "Save to travel" cards; they gave the public camping coaches, railbars, cinema coaches, hairdressing saloons on expresses and many other facilities. How many British, American, or, indeed, German industries can match the magnitude or foresight in long range planning and development of British railways up to 1939? British railways spent £1,000,000 a year, pre-war, in research and development for every aspect of their services. Before the war the standard of comfort on trains was unsurpassed anywhere in the world (particularly having regard to the fares charged); the risk of death was reduced to 1 in 440,000; transport of many forms of freight became the cheapest in the world. As soon as the railways are released from control they will make even greater strides in scientific development, in modernisation, and in the introduction of new ideas and facilities.—From "Answers to Questions and Statements," issued by the British Main-Line Railway Companies, 22, Palace Chambers, London, S.W.1.

A police escort was provided on a recent occasion when cigarettes which had been delivered at Armagh Station in Northern Ireland were distributed to tobaccoists.

NOT—SO RAILWAY MANIA!
A FORTUNATE RAILWAY SPECULATOR.—It is asserted that Mr. Frederick Ricketts, Chairman of the Bristol & Exeter Railway, has cleared £160,000 in the last four months.—From "The Manchester Guardian," September 12, 1845.

"Let anyone, who wants to get on with a job try being patient in these days with a Government or Municipal Department. He will get no notice whatever. To get any attention at all he has to worry, nag, repeat himself, waste time, temper, postage, telephone calls; then, at last, something may possibly happen. Docility and politeness will get him nowhere. Bureaucrats seem to divide their citizen-victims into two classes, the mugs and the nuisances. The letters of the mugs go into the tray. The nuisances begin, at long last, to get an answer."—Ivor Brown in "The Observer."



[Reproduced by permission of the proprietors of "Punch"]

NO TRACE OF THE OWNER

Africans in the Gold Coast, investigating the contents of the stomach of a 16-ft. crocodile, found six brass bangles, two pieces of lead, two talismans, and the undigested remains of an old felt hat. There was no trace of the owner.—From "The Newcastle Journal."

TAILPIECE

(The need for salvage remains urgent)

Although today the wily Jap is curled up on the floor, The need to keep on saving is as urgent as before. The bits we saved in wartime are important now as then, Till the channels of production are completely free again.

A scrap of this, a scrap of that—it's little but it counts. It may seem unimportant but the total quickly mounts. So ponder well ere you discard the very smallest thing, The metal, rubber, paper, and the little bit of string.

E. C.

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

SOUTH AFRICA

Durban Harbour Improvements

Durban Harbour has emerged from six years of war as the finest in the Union of South Africa. As a naval base it is capable of accommodating anything from a submarine to a battleship, and new deep-water berths for large liners have been completed. The Bluff wharves are being extended to the oil sites, and the State has taken over control of the former flying boat station. This has been accomplished at a cost to the Union Ministry of Transport of nearly £4,500,000.

Giant sheds are being completed with the most modern equipment. Commanding the entrance to the harbour is the new Customs House, the finest in the Union. Much wartime development was concentrated at Salisbury Island, Island View, and at the Bluff, and Admiralty contract work has changed the face of the former popular holiday resorts. Large wharves jut out towards the former inner moorings, the Island View Channel has been deepened near the oil sites and a concrete causeway, carrying both road and rail traffic, connects the island to the Bluff, where previously there were only swamps.

The wharf at Island View has been extended at a cost, so far, of £79,110. The completed work will cost £110,545. The deepening of the Island View Channel has cost £12,000, and a further £18,000 is to be spent on this work. The demolition of the Bluff lighthouse to prevent the screening of the Bluff battery guns, and the consequent provision of north and south automatic lights, cost £10,000. The new workshops at the bay head are estimated to cost £2,490,000, and £100,000 has been spent on preliminary works.

Coal Traffic

Coal despatched by rail from Natal and Transvaal collieries during the first week in July amounted to 347,643 tons, an increase of 17,480 tons on the figure for the previous week. The traffic was maintained during the month, the total amounting to 1,693,117 tons, an increase over the previous month of 131,653 tons. This increase in deliveries resulted from the drastic action by the Railways & Harbours Administration in curtailing loadings of general traffic to make way for coal. Import traffic is very heavy and regular clearances from harbour sheds have to be maintained; this entails a steady and increasing demand for trucks.

UNITED STATES

New Sleeping-Car Design

Last year's judgment in the Pullman monopoly suit is encouraging manufacturers who never have previously had any market for sleeping cars to develop variants of this type of vehicle. The Edward G. Budd Company of Chicago, well-known in connection with the stainless-steel type of railway coach, has designed a "cabin car" of stainless-steel construction, of the 85-ft. length standardised in this firm's vehicles, and containing 22 completely-enclosed rooms, in pairs on either side of a central aisle, each with a bed 6 ft. 4 in. long by 2 ft. 11 in. wide. During the daytime the beds are folded out of sight, and they are lowered or raised by a small electric motor, on the touch of a switch. The bed frames are lightweight magnesium stampings, and the mattresses are of 4-in. foam rubber. When the bed is in place for the night, a small table, a case for valuables, and a

reading lamp are conveniently adjacent to the bed head. The beds are arranged longitudinally.

For day occupancy, there is a wide and deep transverse seat, upholstered in foam rubber, wide enough to seat two and capable of tilting for comfort. Each room has its own toilet arrangement, the cover to which forms another upholstered seat, and a folding wash-basin. A clothes cupboard and a shoe cupboard are provided, with a locker for carafe and glass and an alcove for toilet articles.

Heating, Cooling and Lighting

Heated or cooled air, controlled in temperature by a thermostat, and in volume by a regulating knob inside the compartment, enters through an overhead diffuser outlet. Fluorescent lighting is provided, and is supplemented by ordinary ceiling lights, when additional light is desired, as well as by the bed lights. There are also connections for electric razors and curling irons.

Other features of the car include sound-deadening construction, rounded corners for efficient cleaning, and ready access to all plumbing and mechanical fixtures through removable panels in the corridor. At one end of the car there is a baggage locker, a locker containing temperature and other controls, and a linen cupboard; at the other end there is additional toilet space, a lavatory, and an attendant's compartment.

This first Budd sleeping car is to be followed by other all-room designs.

Illinois Central New Streamliner

The Illinois Central System is planning to duplicate its popular "Panama Limited" diesel-electric streamline train, between Chicago and New Orleans, and so to extend the benefit of such high-speed travel over this route to the equivalent of the third class passenger. The Panama Limited, which is composed entirely of Pullman sleeping, dining, and lounge accommodation, makes an overnight run in 18 hr. over the 921 miles between the two terminals; but the all-coach "City of New Orleans," as the new train will be called, will be run as a day service, and with its lighter load should be able to make the journey in 16 hr. or less. It will be a similar train to the all-coach "City of Miami," which is operated every third day by the Illinois Central in the pool service between Chicago and the Florida Coast resorts.

ECUADOR

Increased Rates and Improved Equipment

Goods and passenger rates on the Guayaquil-Quito, the Sibambe-Cuenca, and the Guayaquil-Salinas sections of the National Railways were increased about 20 per cent. from July 1. The increased revenues are to be applied to the purchase of new rolling stock, the construction of bridges, and to the acquisition of mechanical goods-handling equipment. The National Railways have also contracted with a United States firm for approximately \$100,000 worth of mechanical goods-handling equipment, including electrically-operated trucks, chain hoists, and derricks. The supplying firm estimates that the railways will save this amount in handling charges in less than a year.

On July 15, a daily one-day passenger-train service was inaugurated between Guayaquil and Quito as a result of the arrival of long-awaited railway repair parts. This service is a much-needed improve-

ment, as this line carries the bulk of the traffic in Ecuador. Air services between Guayaquil and Quito have also been increased.

MOZAMBIQUE

Transport Conditions in 1944

The five State-owned railway systems in Mozambique comprise 700 route miles of 3-ft. 6-in. gauge line, of which 52 miles have been constructed since 1940. In addition, there are 87 miles of 2-ft. 6-in. gauge railway. The total length of bus and lorry routes is 1,480 miles. Goods carried in 1944 which originated on these railways amounted to 383,619 long tons, and that which originated on others totalled 1,497,217 tons. Passengers carried numbered 747,489. The operating revenue (railways only) amounted to 62,811,879 escudos (110 escudos = approximately £1); other revenues from ports and rivers, bus and lorry services, and airways amounted to 47,406,829 escudos. The operating expenses totalled 49,336,177 escudos (railways), and other expenses 35,910,760 escudos.

SWITZERLAND

Shortage of Goods Wagons

The shortage of goods rolling stock in Switzerland arises, in the main, from the fact that large numbers of wagons have to be sent abroad to fetch consignments for Switzerland. The railways of neighbouring countries are not in a position, because of their depleted rolling stock, to provide the wagons as in pre-war years. The position is indicated by the following figures. In 1939, mainly in the first four months of the war, 23,000 wagons were sent abroad to fetch goods for Switzerland; the total rose to 81,000 in 1940 and to 103,000 in 1941, attaining the maximum of 106,000 in 1942. In 1943, the number dropped to 96,000 and in 1944, it was 70,000. In the course of the first seven months of 1945, 15,000 wagons were sent to France alone. The high totals between 1940 and 1942 are accounted for by the numerous trains sent to Germany to fetch coal and other materials vital to Swiss industry. Subsequently, with the growing disruption of Germany's economic life, this traffic was curtailed.

To overcome the effects of the wagon shortage various measures were introduced and others are contemplated. Recently, the limit of 3 miles for which no wagons were made available, was extended to 12½ miles, although this distance is measured in a straight line. At present, standard-gauge wagons loaded in Switzerland average 8,000 a day, although requirements are higher. In the course of the war, the stock of standard-gauge goods wagons of the Swiss railways (both Federal and privately-owned railways) increased from 18,972 to 21,650.

Reconditioning Difficulties

In reply to a proposal to convert condemned passenger carriages into goods wagons, to relieve the shortage, the Swiss Federal Railways have pointed out that such a conversion would not be feasible, as the comparatively weak springing of the old carriages would not allow a loading weight in excess of 5 to 6 tonnes a wagon. Springing could not be reinforced as the necessary springs were not now obtainable in Switzerland. In addition, the roofs of most of the vehicles would require extensive repairs, and alterations (apart from the boarding of the windows) would have to be made in the side walls to provide suitable doors. Further, these extensive alterations would absorb much labour and time, in addition to material urgently required for other purposes.

L.M.S.R. Fuel Efficiency Campaign

Results achieved in C.M. & E.E. Workshops

THE L.M.S.R. fuel efficiency campaign was initiated in December, 1941, when the Vice-President appointed a Fuel Efficiency Committee to investigate the possibilities of saving fuel in all departments of the company. The C.M.E. Department was represented on this committee by two members.

In June, 1942, it was decided to appoint District Fuel Efficiency Officers to cover all forms of fuel consumption in their respective districts with the exception of locomotive fuel and that consumed in the C.M.E. Department main workshops.

By the courtesy of Mr. C. E. Fairburn, Chief Mechanical & Electrical Engineer, London Midland & Scottish Railway, we are enabled to publish the following account of the method adopted and the results obtained. Fuel efficiency in the works of the C.M.E. remained the responsibility of the Works Superintendent and fuel wardens were appointed in each works. Their duties were:—

(1) To keep a close watch for any wastage of fuel, power, or light, whether resulting from carelessness of the staff or from plant in a poor state of repair.

(2) To suggest alterations in practice or in the design of plant, with a view to saving fuel.

These wardens reported to their Works Superintendents who remained responsible for taking the most suitable action.

In the same way that the Works Superintendents remained responsible for their works, so also the foreman of each shop remained responsible that there was no wastage of power, light, gas, water, and compressed air. To assist foremen in this respect, fuel watchers were appointed in many of the larger shops; their main function was to ensure that lights were not left on or electric motors left running when not required.

It is realised at the outset that the only way to obtain immediate economies was by making the most efficient use of the plant as it existed. Obviously from a long-term point of view, much of the plant is capable of improvement. The works were for the most part laid out and equipped at a time when coal was relatively cheap and when simplicity was more attractive financially than high thermal efficiency. It was out of the question to make radical alterations at a time when the works were heavily loaded with both railway work and munition work, as not only was it impossible to close down any portion of the plant for alteration but also labour and material were very scarce. In fact, even minor improvements had to be examined in the light of whether the man-hours expended in making the improvement would result in saving a greater number of man-hours in the mines.

Methods Adopted

It was realised that savings could best be achieved by close personal contact of the fuel wardens with the actual job. Clerical and statistical work was therefore cut down to a minimum so that the fuel wardens could spend their time in the shops.

The only returns called for by Headquarters were:—

(1) A four-weekly return of the amount of fuel, electricity, gas, etc., consumed. This is plotted on the basis of B.Th.U. per man-hour worked, and although no direct comparison is possible between different works (because of difference in

the kind of work involved), this chart is very useful in showing whether there is a tendency for the fuel consumption to rise or fall in any particular works.

(2) A six-monthly report of the total savings achieved up to date.

Main Source of Savings

The greater part of the savings has been made in the production and use of steam. Close attention has been paid to the state of repair of boilers. The maintenance of grates and mechanical stokers has been improved, air leakages in flues have been stopped, the boiler house staff has improved its method of firing. Considerable use has been made of CO₂ instruments, both fixed and portable, to track down losses due to excess air. Close attention has been paid to lagging of steam pipes and a considerable amount of coal has been saved thereby; also steam mains have been shut off whenever possible, and leaking joints and valves have been attended to. A large amount of steam has been saved by eliminating leakage in steam-consuming appliances, particularly steam hammers. A simple form of meter was devised and constructed which is placed at the open end of the exhaust pipe and gives an indication of the amount of steam lost by leakage while the hammer is standing. This leakage was found to be considerable, and has been overcome by fitting rings to the piston valves and, in the case of one large hammer, an entirely new design of double-seated poppet valve has been adopted. A close watch has been kept on steam traps to ensure that they discharge the condensed water without loss of steam.

As to shop heating, a large amount of coal has been saved by regulating the temperature so that it is not in excess of what is required. A further saving has been made by a voluntary curtailment of the heating season, as far as can be done without affecting the efficiency.

A substantial saving has also been made in electricity. Although every effort has been made to save on lighting by the removal of blackout shutters and by extinguishing unnecessary lights, it must be borne in mind that the whole of the lighting is about only 10 per cent. of the total current used. Hence the greater saving is obtained by avoiding the running of electric motors when these are not required. In many cases unit drives for machine tools avoid the wastage of power which occurs when a long line of shafting is run for only one or two machines.

Another important economy in electricity is that obtained by saving compressed air, as the compressors are invariably electrically driven. This has been done by eliminating leakage in air pipes and hoses and particularly at the unions. The length of metallic pipe in many cases has been extended to allow shorter rubber hoses to be used, which in addition to decreasing the risk of leakage through the hose, is also a saving of rubber which is now in short supply. Perhaps the most important of all is the greater attention which has been given to the state of repair of the pneumatic tools themselves. At the commencement of the campaign a test was made which showed that a pneumatic drill needing repairs (although still capable of being used) consumed 4 times as much air as a similar drill in good repair. Special care, there-

fore, has been taken to repair defective tools and tests have been devised to determine the state of efficiency of a pneumatic tool either when needing repairs or after repairs have been completed.

There has been a saving of gas by various methods. This included the organisation of work so that a gas-fired furnace is not lit up for a small number of articles only. Gas rings for heating tyres have been fitted with heat insulated covers to retain the heat and an automatic valve shuts off the gas when the tyre is removed. Gas rings have been removed from offices and gas fires in some cases have been replaced by steam radiators.

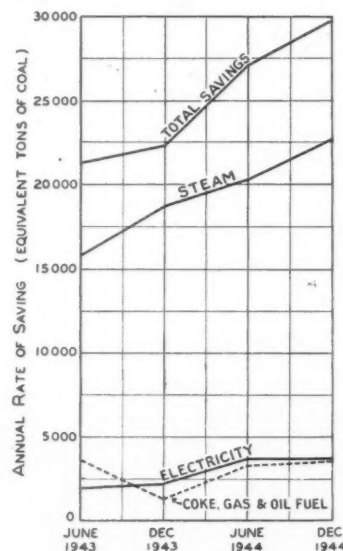
Coke, creosote, pitch, and petrol have been saved by close attention to detail. In a number of cases coke has been substituted for coal for steam raising, as at one time coke was in a much more plentiful supply. At the present time, however, coke is almost as scarce as coal.

Results Obtained

The Works Superintendents send in every six months a statement of the savings achieved in coal, electricity, gas, coke, fuel, oil, etc. The definition of saving is the difference between the amount used and what would have been used under present conditions of work but for the Fuel Efficiency Campaign. The quantities of each kind of fuel or power are reduced to the equivalent of coal having a calorific value of 14,000 and the resultant saving is expressed as a percentage of the estimated total equivalent coal consumption.

The aggregate figures for all the works are:—

Date	Total saving Tons	Percentage saving
June, 1943	21,132	13.6
Dec., 1943	22,275	14.3
June, 1944	27,201	17.5
Dec., 1944	29,906	19.2



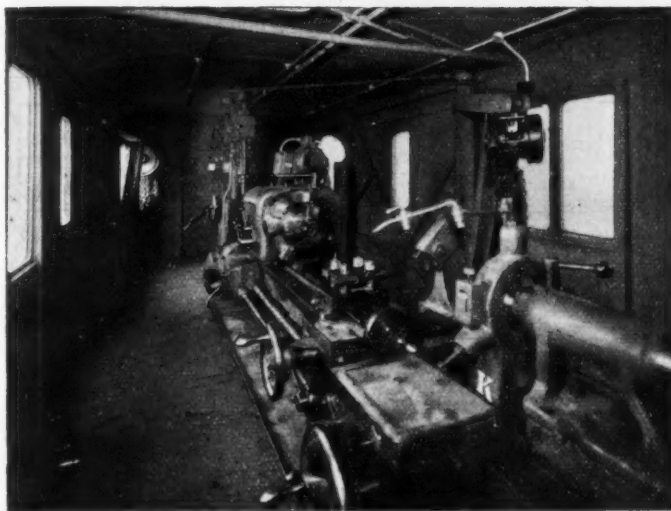
Rate and total of saving

The accompanying graph shows the rate of total saving for all the main works at the end of each 6-monthly period. It also shows how the total saving was made up. These savings have been obtained without any major alteration to the plant and are largely due to the efforts of the fuel wardens in giving close attention to

(Continued on page 297)

Military Workshop Trains

Mobile units used by the Royal Engineers in Europe



Interior of van A, showing 8½-in. lathe, of the workshop train

WITH fast moving battle fronts, the part played by the railways in bringing forward men and materials assumed unparalleled importance in the recent war. Lineside and railhead facilities, because of military action or enemy demolition, were often inadequate or even non-existent. Railway workshops and equipment essential for purposes of maintenance and repair were also lacking. To overcome these difficulties a number of workshop trains were provided for use on European railways. By courtesy of the Director of Royal Engineer Equipment, Ministry of Supply, we publish particulars of the special workshop trains fitted out by W. G. Bagnall Limited, of Stafford, in association with Cowlishaw Walker & Co. Ltd., of Stoke-on-Trent.

Each train consists of six 20-ton United States goods wagons adapted and modified for their respective purposes. The first vehicle is a generator van with self-contained power plant that supplies electric current to the whole train. The second and third vans are equipped with machine tools and a fourth contains welding plant and equipment. The fifth wagon

is an air-compressor van and the last is used for stores.

In the first van a 30-kw. diesel generator set, supplied by the War Office, is installed in the centre of the vehicle and racks are provided for 48 jerricans—the welded pressed-steel petrol containers used in hundreds of thousands by the Forces. Modifications carried out included fitting a door in the end of the van, next to the hand-brake. The door has a wooden frame with a sheet-steel panel and is fitted with a blackout curtain. A steel handrail is fitted to the outer side of the doorway, together with a footstep. This end door is additional to the sliding doors, on each side, with which the van was built. Two ventilators are provided at each end of the van with one large ventilator, covered by a sheet-steel cowl, in the centre of the roof. Each side of the van is provided with two single and two double windows and the sliding doors have also been fitted with single windows. The windows are glazed with special glass and are provided with sliding shutters for blackout purposes.

Windows were fitted to all other vans of the train except the stores wagon. The generator van is also fitted with a 30-gal. galvanised steel water tank, mounted on a timber stand and secured to the floor by steel bands. The tank is provided with a draw-off cock and a timber cover, and a 4-gal. can is provided for filling the radiator of the generator. The generator exhaust is covered with asbestos and is led to a silencer outside the van. Provision is made for carrying two fire extinguishers in each van. Electrical equipment includes two roof lamps and an inspection lamp with lead. A switchboard is mounted at one end of the van, and a 3-pole 25-kw. 250-volt a.c. power plug is provided to supply current to the train from an external source of supply when required. Two sets of 6 "C" type cells, L.M.S.R. pattern, are carried in timber boxes on the underframe of the van, for the electric lighting installation.

A certain amount of welding was necessary in carrying out the modifications. Strengthening plates and angles were welded to the van underframes to take the holding-down bolts for the generator. Hooks were also welded to the underframe, to carry oak packing wedges on chains. Lashing brackets were riveted to the solebars on either side of each wheel. The train is fitted with full Westinghouse brake equipment and with a through vacuum train pipe. The original hand brake leverage was doubled by the introduction of a pulley and chain between the headstock of the van and the pull rod of the brake. To facilitate the negotiation of curves, steel washer plates were inserted between the drawhook and the headstock at both ends of the vehicle.

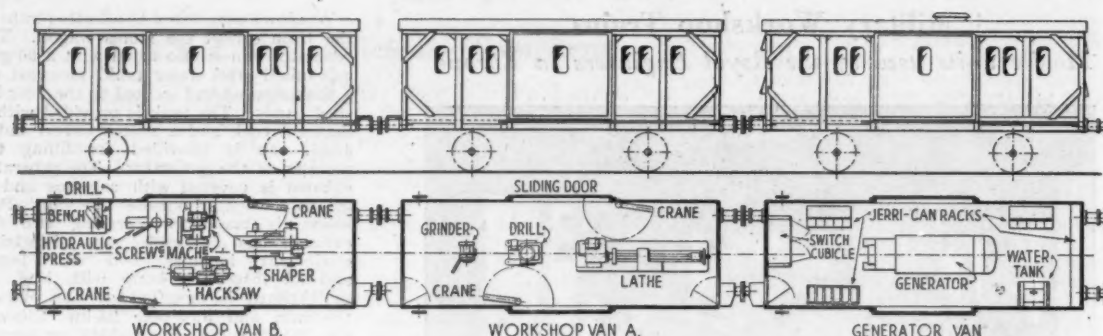
A trolley runway was fitted to the wagon, supported at one end by steel plates and angles attached to the end of the van and at the middle and at the other end by steel angle framework. The runway is equipped with a Morris 1-ton travelling trolley.

The vehicles were supplied by the War Office to W. G. Bagnall Limited semi-erected, that is, with the underframes completely assembled and on their own wheels, with the ends, sides, doors and roofs for each loaded on top of the floors ready for erection after modification. All vehicles were subsequently painted and stencilled with tare weights and identification numbers.

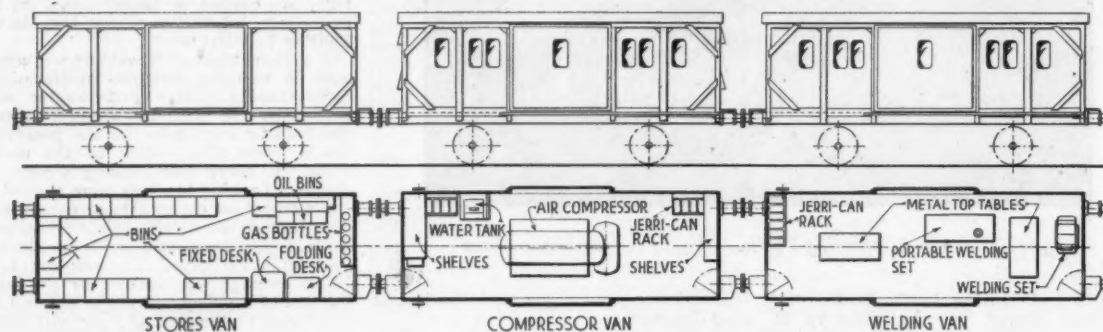
In the second, or workshop van A, modifications included the cutting of two additional doors, one at each end. The machine tools installed, supplied by the War Office, comprise an 8½-in. surfacing,



The complete military workshop train with generator van at end



Plan and elevation of military train, showing generator and workshop vans



Details of stores, compressor, and welding vans of the mobile-workshop train

eliding and screw-cutting lathe, a 15-in. heavy duty pillar drill and a pedestal tool grinder. The tools are provided with individual lighting. Strengthening pieces were welded to the van underframes to take the holding-down bolts of the machine tools. The vehicle is fitted with two 1-ton jib cranes, mounted on toe-steps with top-bearing brackets and with strengthening plates and tie rods. Two 1-ton, triple-gear Morris pulley blocks are used with the cranes, which are locked back against the side of the van when not required.

Other modifications to the workshop

van, in respect of electric lighting, brakes, handrails and blackout arrangements, are similar to those carried out on the generator wagon and on the remaining vehicles of the train. A feature of workshop van A is the provision of a distribution board having four 230-volt a.c. power plugs for use with portable electric machines. Plugs are also provided for an inspection lamp. The third vehicle of the train, workshop van B, was modified in a similar manner to van A. The machine tools, supplied by the War Office, include a 20-in. stroke shaping machine, a 6-in. by 6-in. power hacksaw, also a 4-in.

pipe screwing machine, a 16-ton hydraulic press, and a $\frac{1}{2}$ -in. capacity sensitive bench drill mounted at one end of a fitter's bench secured to the van floor. All machine tools are provided with adjustable arm lamps. Provision is also made for carrying a collapsible fitter's bench at the end of the van. Jib cranes are fitted similar to those on van A. Electric power and lighting points are also provided as in the other workshop vehicle.

The fourth vehicle of the train is a welding van, and here again modifications were carried out similar to those on the other wagons. The main equipment comprises a welding machine from which the wheels and under-carriage were removed and replaced by a channel iron framework. The machine was bolted to the floor of the van. A second welding machine, self contained and petrol driven, was delivered to W. G. Bagnall Limited for conversion into a portable set. This was done by attaching a rear axle to the frame and bolting on the swivelling truck frame taken from the fixed welding set, which also provided the necessary wheels. This petrol-driven set is intended for use outside the van, and a 1-ton jib crane is provided for handling it. Toe-steps and bearing brackets for the crane are fitted alongside each of the side doors: this can be used on either side of the van as required. Fuel for the petrol engine is carried in six jerri-cans on a rack. Additional equipment for the welding van includes two tables fitted with metal tops and cupboards. The electrical fittings include two power plugs for use with a portable welding set.

Modifications to the fifth vehicle, an air-compressor van, are similar to those for the rest of the train. The I.C. engine compressor is installed in the centre of the van, with an air-delivery outlet pipe and shut off cock to each side of the van under the solebars; the exhaust



The shaping machine in workshop van B, with power-hacksaw and screwing machine in background

is led to an external silencer. A 30-gal. water tank is fitted, similar to that in the generator van. Storage racks are fitted for maintenance and compressed air tools together with racks for 24 jerricans for fuel. Bins are at both ends of the van for storing tees, bends, sockets and plug-cocks and underneath the compressor unit are stored forty 10-ft. lengths of $\frac{3}{4}$ -in. bore, screwed and socketed, air piping.

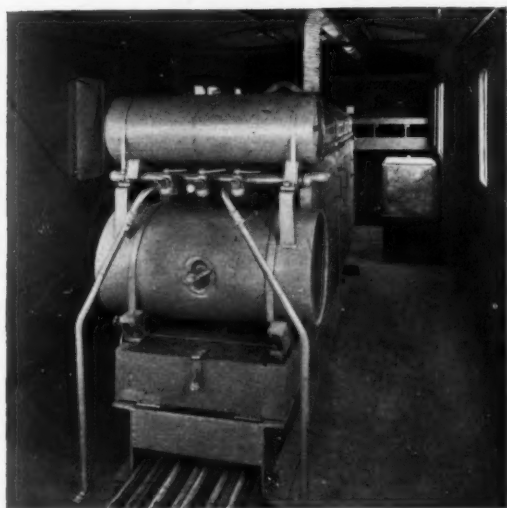
The remaining vehicle of the train is a stores van, and here again the modifications are similar to the other vehicles, except that no windows are fitted and there is only one end door, as in the generator van. Blackout curtains are provided for the end door and for both of the sliding doors at the sides. The inside of the van is fitted with shelving to provide storage bins; the top shelf is carried continuously round the van as far as possible. On one side of the van is a 12-gal. triple pump oil cabinet. Racks are also fitted next to the end door to carry oxygen and acetylene gas cylinders. At the opposite end of the van is a lock-up cupboard for special tools. On one side of the wagon are two storekeeper's desks, one of which is fixed and is provided with an upholstered swivelling seat and a separate reading lamp. The other desk is of the folding type with swing supports.



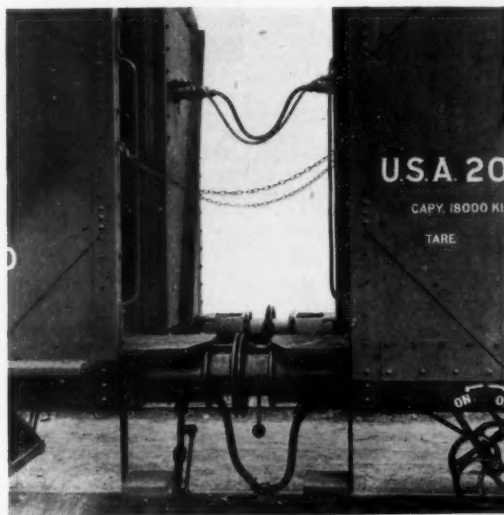
The welding machine and metal-topped tables in the fourth vehicle of the workshop train

A book rack is provided above the desks. It will be noted that the train constitutes a complete six-department workshop

on wheels, fully equipped for a wide range of repair and maintenance work on the railway and its vicinity.



Air compressor with supply tanks and store of air piping on floor of van



Electrical connections and steps providing communication between vans of the train

THE TURKISH ORIENTAL RAILWAYS COMPANY.—The liquidators of the Oriental Railways Company, taken over by the Turkish Government on January 1, 1937, have decided to provide for payment of an additional 25 French francs a share. An earlier payment of 36 French francs a share was made in March, 1943.

G.W.R. WEYMOUTH-CHANNEL ISLAND CARGO SERVICE.—The Great Western Railway steamer *Sambur*, which is to provide a twice-weekly cargo service in each direction between Weymouth and the Channel Islands (which commenced on September 18), and the *Roebuck*, which also will be used on this service shortly, are vessels with an imposing war record. They ran on the Channel Islands service until May 29, 1940, immediately after which

they took part in the evacuation of British troops from Dunkirk.

A little later that were sent to St. Valery to evacuate more troops, but on arrival there found the Germans in occupation and were heavily shelled by shore batteries. They reached England, badly damaged and with many casualties. Still later they were taken over by the Royal Navy and for a long period escorted convoys up the English Channel and through the Straits of Dover.

Some time before the invasion of France the ships were returned to the company for management, and were fitted up for work with the sections of the Army which had to prepare the "Mulberry" ports. The *Roebuck* and *Sambur* were fitted with special pumps and were required to refloat the sections of the "Mulberry" ports

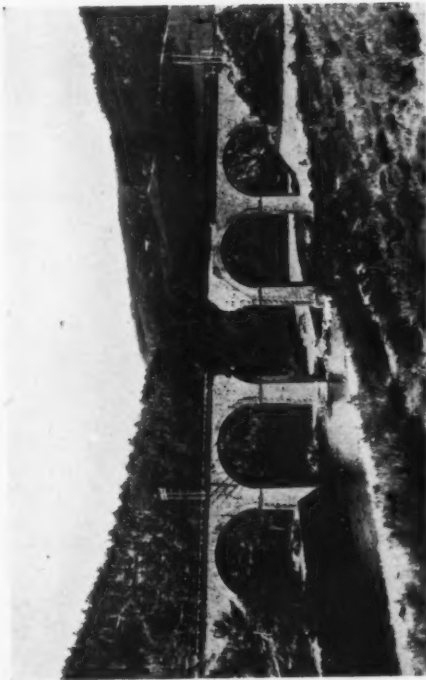
sunk in various parts around England for refloating when required. After floating the various sections, they towed them to sea and handed them over to Naval tugs.

After the invasion of France both vessels were fitted up for special work with the Army dredging units, and later were handed back to the company for re-conditioning.

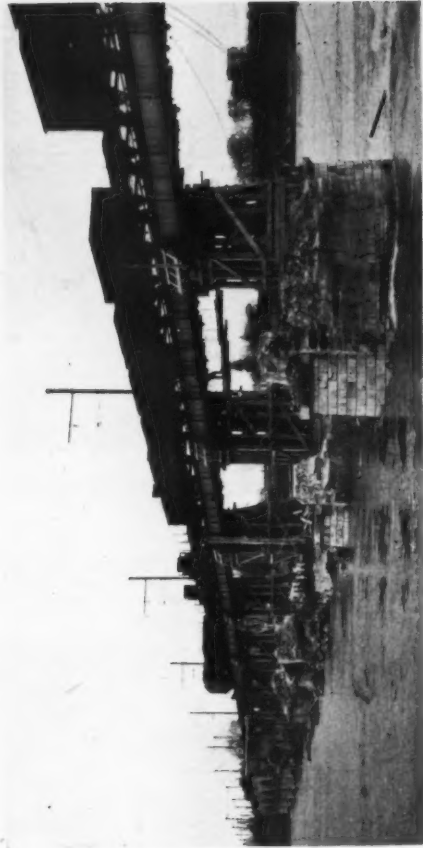
BOLIVIAN TRANSPORT AND PRODUCTION PLANS.—At a recent press conference the President of Bolivia, discussing post-war economic questions which were being studied by the State, said that the joint problem of transport and production would have preferential attention. Emphasis would be placed on the construction of roads to producing zones rich in crops and livestock, and on the extension of current railway construction work.

French Railway Resistance and Reconstruction

(See article on page 301)



Bouchatel Viaduct, between St. Germain-des-Fossés and Nîmes, in Central France after being attacked by a railway resistance group



The important Orleans bridge over the River Loire, on the line from Les Aubrais to Montauban, after restoration to service following temporary repairs



Remains of the viaduct of Nogent-le-Perreux on the River Marne, near Paris



Damage to the Combe de Lée bridge. The gap was afterwards bridged by a line carried on temporary trestling

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RAILWAY NEWS SECTION

PERSONAL

Sir William Stanier (Adviser to the L.M.S.R. on Mechanical Engineering, and formerly Chief Mechanical Engineer of that railway) recently left London as a member representing the British Standards Institution of the British delegation to the Conference on Unification of Engineering Standards, which opens in Ottawa on September 24.

Mr. H. W. Stevens, B.Sc. (Eng.), M.Inst.C.E., has been appointed Maintenance Engineer, Buenos Ayres Great Southern and Western Railways, in succession to Mr. J. E. Sandham, whose appointment as Engineer-in-Chief was recorded in our August 17 issue.

We regret to record the death on September 13, at the age of 74, of Sir Laurence Edward Halsey, K.B.E., F.C.A., an Auditor of the L.N.E.R. since 1938.

Mr. A. B. Rosevear, K.C., Senior Solicitor, Western Region, Canadian National Railways, Winnipeg, has been appointed Assistant General Solicitor for the system in Montreal.

The late Mr. R. P. Brousson, who was Chairman of Scammell Lorries Limited, and who was General Manager of the Great Northern & City Railway from 1909 to 1913, left £77,434.

Mr. F. B. Greenwood, Chief Engineer to the Manchester Ship Canal Company, has retired. He has been succeeded by Mr. R. D. Brown.

Channel Islands Airways Limited announces that Commander G. O. Waters, R.N.V.R., A.R.Ae.S., General Manager of the company and of its associates, Jersey Airways Limited and Guernsey Airways Limited, has been appointed Managing Director of all three undertakings.

SOUTH AFRICAN RAILWAYS & HARBOURS

Appointments involving the re-organisation of the department of the General Manager have been officially announced. Each of the main sections of activity is to be controlled by a chief manager, of whom there will be six in addition to the Chief Civil Engineer, Mr. J. S. de V. von Willich, and the Chief Mechanical Engineer, Mr. M. M. Loubser, who will retain their present titles. The appointments are as follow:—Chief Technical Manager: Mr. E. H. Wilson (at present Chairman of the S.A.R.H. Tender Board, and Chairman of the Economic Bureau); Chief Harbour, Shipping & Development Manager: Mr. D. H. C. du Plessis (at present System Manager, Johannesburg); Chief Operating Manager: Mr. J. Viljoen (at present System Manager, Pretoria); Chief Commercial & Industrial Manager: Mr. D. M. Robbertze (at present Chief Rates Officer); Chief Staff Manager: Mr. J. Timperley (at present Chief Superintendent, Staff); Chief Airways Manager: Major-General C. J. Venter (at present Director-General of Air Force). Each of these officers will be responsible for the operation of his own division, and combined they will constitute an advisory committee to the General Manager.

Mr. Victor Michael Barrington-Ward, C.B.E., D.S.O., M.Inst.T., Assistant General Manager (Operating), London & North Eastern Railway, who, as recorded in our August 24 issue, has been appointed Divisional General Manager (Southern Area), was educated at Westminster and at Edinburgh University, where he took his engineering degree. He entered the service of the Midland Railway in 1907, and had experience both of construction and maintenance. During this period he was awarded the



Mr. V. M. Barrington-Ward

Appointed Divisional General Manager, (Southern Area), L.N.E.R.

Miller Prize of the Institution of Civil Engineers. Subsequently he was transferred to the Operating Department, where he received training in all its branches. In 1914 he was appointed Assistant to the Passenger Train Superintendent, in which capacity he assisted personally the then General Superintendent, Sir Cecil Paget, in connection with various problems. At the outbreak of war in 1914, he volunteered, as an ex-Territorial officer, and joined the 11th (Pioneer) Service Battalion, South Lancashire Regiment, in which he held the rank of Captain; but he was transferred, as Major on the headquarters staff, to the Railway Operating Division on its formation in 1915. Mr. Barrington-Ward subsequently became Lt.-Colonel, and commanded a large group of operating companies; he was awarded the Distinguished Service Order for gallantry, was mentioned in despatches four times, received the French Croix de Guerre with palm, was cited in French Army Orders, and finally was awarded a Brevet Lt.-Colonelcy. In March, 1919, he joined the personal staff

of Sir Eric Geddes, at the request of the latter; and, on the formation of the Ministry of Transport, he was appointed Director in Charge of the Railway Operating Section, on loan from the Midland Railway. In 1922 he joined the General Manager's staff of the North Eastern Railway, and in January, 1923, became District Superintendent, Middlesbrough. In 1927, he was appointed Superintendent, Western Section, Southern Area, of the L.N.E.R., becoming Superintendent of the whole of the Southern Area in 1939. Mr. Barrington-Ward was appointed Assistant General Manager (Operating) in 1942, and has since had control of the company's Central Traffic Office and co-ordination of inter-area operating arrangements. Since 1938 he has been Chairman of the Railway Executive Committee Operating Committee. Mr. Barrington-Ward is the United Kingdom member of the executive board of the Provisional Organisation for European Inland Transport. Mr. Barrington-Ward was largely instrumental in organising and raising the Transportation troops of Royal Engineers, Supplementary Reserve, and was Lt.-Colonel commanding the Operating Group, Royal Engineers (S.R.), from 1924 to 1928. In January, 1936, he was appointed an Officer of the Venerable Order of the Hospital of St. John of Jerusalem. In 1938 he was awarded the Operating Gold Medal of the Institute of Transport for a paper on "Railway Operation," read before that Institute. Mr. Barrington-Ward was appointed a Commander of the Order of the British Empire in the King's Birthday Honours this year.

The L.M.S.R. announces that Mr. W. P. Bradbury, Assistant Chief Commercial Manager (Outdoor), has been appointed a Director of Cumberland Motor Services Limited, East Midland Motor Services Limited, and North Western Road Car Co. Ltd. Mr. Bradbury is a Director of several other railway-associated road and air undertakings.

It is announced also that Mr. A. Jessop, Assistant (Outdoor) to Chief Commercial Manager, L.M.S.R., has been appointed to the panel of the Todmorden Corporation and L.M.S.R. Joint Omnibus Committee, in place of Mr. H. G. N. Read.

Mr. L. P. B. Merriam is being released from his appointment as Controller of Plastics, Ministry of Supply.

We regret to record the death on September 13, at the age of 69, of Sir Percy Walter Llewellyn Ashley, K.B.E., C.B., Vice-President of the British Standards Institution.

Mr. L. Reeves, M.I.Mech.E., Mechanical Engineer, Scotland, L.N.E.R., who, as recorded in our June 22 issue, has been appointed Mechanical Engineer, Doncaster, joined the staff of the Great Eastern Railway in 1908. After carrying out technical studies at the old Great Eastern Railway Institute and London University College, he performed various duties at Stratford, where he was appointed Assistant to the Locomotive Works Manager in 1930, and Assistant Locomotive Works Manager in 1933. Mr. Reeves was appointed Loco-

**Mr. L. Reeves**

Appointed Mechanical Engineer, Doncaster, L.N.E.R.

motive Works Manager, Darlington, in June, 1941, and Mechanical Engineer, Scotland, in May, 1942.

Mr. John Bromley, whose death we recorded last week, was General Secretary of the Associated Society of Locomotive Engineers & Firemen from 1914 to 1936. Mr. Bromley was born in 1876, and joined the Great Western Railway as an engine cleaner at Shrewsbury in 1890. He first acted as fireman two years later, while still a cleaner, and afterwards carried out a good deal of spare firing until registered a regular fireman at Wolverhampton in 1896. He was registered as driver in 1905, but retired from the company's service in 1910, on being elected Organising Secretary of the Associated Society of Locomotive Engineers & Firemen. Meanwhile he had been Branch Secretary of the union at Worcester and at Southall, and had been elected to the first conciliation boards on the G.W.R. in 1907, representing the London to Oxford District, having previously been a member of the old Great Western Locomotive Deputation since 1903. Later he was Secretary of the Locomotive Conciliation Board on the Hull & Barnsley and North Staffordshire Railways. Mr. Bromley was elected General Secretary of the A.S.L.E.F. in October, 1914, and held that position until his retirement in July, 1936. He was a member of the Railway Advisory Committee after the 1914-18 war. He was a member of the Trades Union Congress General Council from 1921 to 1936, and was Chairman of that body in 1931 and 1932. Mr. Bromley was Labour M.P. for Barrow-in-Furness, 1924-31.

Mr. H. Eccles, A.M.Inst.T., J.P., Assistant District Goods Manager, Liverpool, L.M.S.R., who, as recorded in our August 10 issue, has been appointed District Goods & Passenger Manager, Stoke-on-Trent, commenced his railway career at

**The late Mr. John Bromley**

General Secretary, Associated Society of Locomotive Engineers & Firemen, 1914-36

Newton-le-Willows, L.N.W.R., and, after serving at Broadheath and Latchford, was transferred to the District Goods Manager's Office at Warrington in 1914. From 1916 to 1920 he was loaned to the Inland Transport Department of the Ministry of Munitions, and returned to Warrington at the end of 1920. His subsequent appointments included those of Assistant Commercial Clerk and Chief Accounts Clerk, after which Mr. Eccles was appointed Chief Commercial Clerk at Warrington in 1931;

**Mr. A. B. MacLeod**

Appointed Stores Superintendent, Southern Railway

**Mr. H. Eccles**

Appointed District Goods & Passenger Manager, Stoke-on-Trent, L.M.S.R.

he was made Commercial Assistant in 1938, and Assistant District Goods Manager in 1941. In May, 1944, he was transferred to Liverpool as Assistant District Goods Manager. Mr. Eccles is a Justice of the Peace for the County Borough of Warrington.

Mr. A. B. MacLeod, A.M.I.Mech.E., M.I.Loco.E., M.Inst.T., Assistant Stores Superintendent, Southern Railway, who, as recorded in our August 31 issue, has been appointed Stores Superintendent, was educated at Cheltenham College, and entered railway service as a pupil under Mr. L. B. Billinton of the former London Brighton & South Coast Railway at Brighton Locomotive Works in May, 1919. After receiving training in the workshops, drawing office and running sheds, he was appointed Assistant District Locomotive Running Superintendent at Brighton, Southern Railway, in 1923. In 1925 he was appointed Assistant to the Eastern Divisional Locomotive Running Superintendent at Waterloo, and in 1928 went to the Isle of Wight as Assistant to the Chief Mechanical Engineer & Locomotive Running Superintendent in charge of the running and maintenance of the locomotives and rolling stock on this section of the Southern Railway. Mr. MacLeod was appointed Assistant for the Isle of Wight in January, 1930, and was responsible to the Divisional Operating Superintendent, and Divisional Commercial Manager, as well as to the Chief Mechanical Engineer and Locomotive Running Superintendent. In May, 1934, he was appointed Assistant Western Divisional Locomotive Running Superintendent at Waterloo, and in April, 1936, was appointed Assistant to the Locomotive Running Superintendent. In January, 1938, Mr. MacLeod was transferred to the Stores Department as Assistant to the Stores Superintendent; and he was appointed Assistant Stores Superintendent on April 1 of that year.

Mr. W. O. J. Urry has been elected a Director of Heenan & Froude Limited, in place of Mr. D. H. M. Boyle, resigned.

We regret to record the death on September 15 of Captain Richard Sharp, who was Marine Superintendent, Great Western Railway, from 1920 until his retirement in 1926.

The Minister of War Transport, at the request of the Southern Railway Company, has released Mr. R. P. Biddle, Regional Port Director for the North-Western Area, to resume his former position as Docks & Marine Manager, Southern Railway. He will be succeeded by Mr. R. J. Hodges, General Manager & Secretary, Mersey Docks & Harbour Board.

LUNCHEON AND PRESENTATION TO MR. GEORGE MILLS

Mr. J. C. L. Train, Chief Engineer, London & North Eastern Railway, presided on September 14, at a luncheon held at the Great Eastern Hotel, Liverpool Street, when a presentation of books was made to Mr. George Mills, Divisional General Manager, Southern Area, from 1941 to 1945, on the occasion of his retirement from the company's service. The subscribers were: Sir Charles Newton, Messrs. A. E. H. Brown, G. B. Barton, Miles Beevor, W. Barnes, C. K. Bird, O. H. Corble, M. A. Cameron, T. F. Cameron, L. R. Christie, C. G. G. Dandridge, R. Davis, L. C. Glenister, R. Gardiner, H. H. Halliday, C. P. Hopkins, F. E. Harrison, R. J. M. Inglis, C. M. Jenkin Jones, W. H. Johnson, Kenelm Kerr, G. A. Musgrave, L. H. K. Neil, J. Ness, L. P. Parker, A. H. Peppercorn, E. W. Rostern, A. P. Ross, H. W. H. Richards, G. Skelton, A. E. Sewell, A. E. Tattersall, A. Tulip, E. Thompson, J. C. L. Train, V. M. Barrington-Ward, A. J. White.

Sir Charles Newton, in making the presentation, related Mr. Mills' railway career and was followed by Messrs. L. C. Glenister, Miles Beevor, G. B. Barton, E. W. Rostern, C. G. G. Dandridge, L. H. K. Neil, A. E. Sewell, J. A. Kay, R. Bell, and J. C. L. Train. Mr. Mills then replied.

L.M.S.R. Fuel Efficiency Campaign (Concluded from page 290)

a number of small items, the cumulative effect of which has been to produce very appreciable economies.

Present Position

The point has now been reached at which it is not possible to expect much further economy merely by making the best use of existing plant. Indeed, the main preoccupation of the fuel wardens will be to ensure that the economies already achieved are maintained and that there is no slipping back. The time seems to have come when consideration can be given to more ambitious schemes involving extensive modification to the plant, particularly as it seems unlikely that the post-war cost of coal will fall back to the pre-war level. It should be borne in mind, however, that whether plant be ancient or modern, the best results will be obtained only if constant attention is given to see that it is used to the best advantage and maintained in the best condition, and in view of the experience of the last two years there must be a good case for the permanent retention of fuel wardens whose special responsibility would be to keep a sharp watch for all kinds of fuel wastage which may very well creep in however good the design of the plant.

Anglo-Argentine Tramways Co. Ltd.

The 61st ordinary general meeting of the Anglo-Argentine Tramways Co. Ltd. was held at Winchester House, Old Broad Street, E.C., on September 3. Sir Bernard Docker, K.B.E., the Chairman, presided.

The Chairman, in the course of his address, said that the long-awaited dividend from the Buenos Aires Transport Corporation, on which this company depended for its income, was still conspicuous by its absence. As time passed, indications became clearer that the management and administration of the corporation's affairs by the trustee appointed by the Argentine Government over twelve months ago were to be carried on completely regardless of the interests and rights of the corporation's shareholders and of the real interests of the travelling public.

The report of the corporation for 1944 contained the same distorted views and fallacious arguments as had always been the basis of the Control Commission's exercise of its functions not only in regard to the question of increases in fares, but also regarding its attitude towards the legally recognised values of the companies' assets transferred to the corporation. He would stress the impressive figure of 103 million pesos shown as the corporation's accumulated losses at the end of 1944,

and mention that the undertaking owed, *inter alia*, at the same date no less than 46 million pesos for the primary working charges of electric power and fuel. Both these facts gave emphasis to the absolute necessity for increasing the fares.

In the absence of any response by the Argentine Government to the company's administrative claim of November last year, it was the company's intention to go to the Courts of the Republic for justice. This was only after the exercise of the utmost patience and following the failure of all appeals to the authorities for fair play. The Courts in Argentina were still the ultimate judges as to the validity or otherwise of the Government's acts.

The report and accounts were adopted.

TEHERAN-CAIRO AIR LINE.—The military air service between Teheran and Cairo, which the British Overseas Airways Corporation has been operating for the British Government since 1942, is to end on September 29. It is being withdrawn in conformity with the terms of the treaty which guaranteed that all Allied military personnel and equipment would be evacuated from Persia within six months of the end of the war.

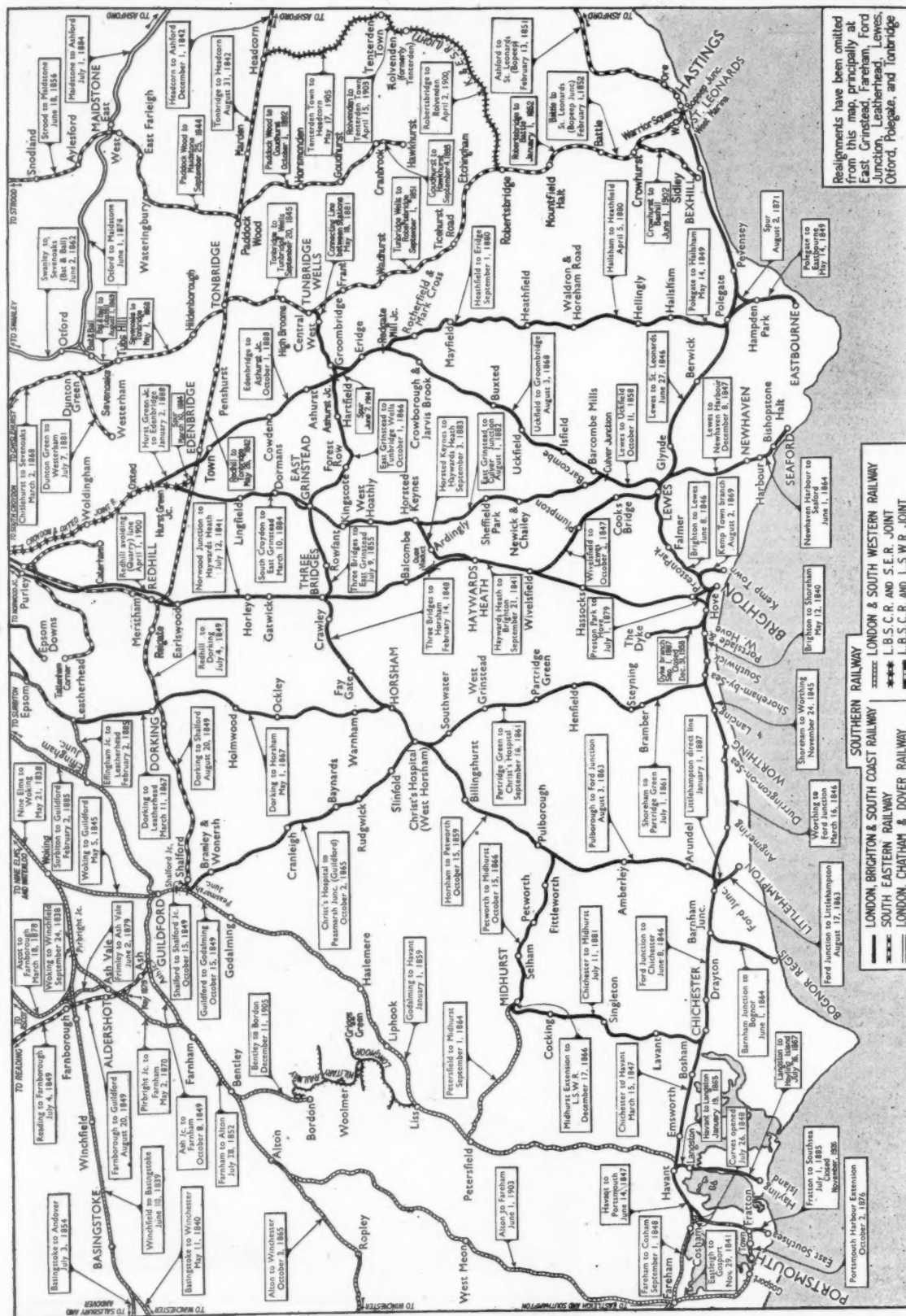
EIRE AND SUMMER TIME.—The Eire Government has made an Order extending summer time throughout the coming winter.

G.W.R. Accident near Llangollen



A general view of the wreckage of the G.W.R. 3.35 a.m. Chester to Barmouth mail train showing the burst canal bank above the railway. A closer view was given in our last week's issue, page 275

The Evolution of the London, Brighton & South Coast Railway



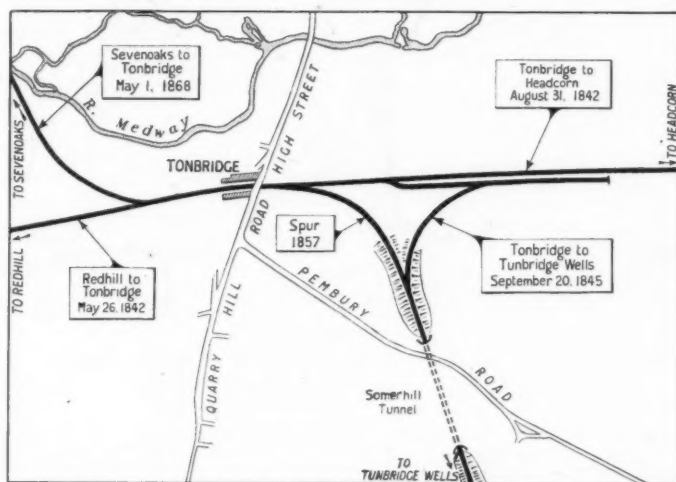
Chronological map showing the development of the London, Brighton & South Coast Railway (one of the constituents of the Southern Railway) and adjacent lines, interest, as Tunbridge Wells (which formed a strategic eastern outpost of the system) celebrates its railway centenary this week

The Tunbridge Wells Railway Centenary

IN accordance with its policy of celebrating locally the centenary of the opening of important sections of its line, the Southern Railway has arranged for an exhibition at Tunbridge Wells, which was due to be opened yesterday (September 20), after we had closed for press.

This exhibition, which includes historical prints, photographs, and other records, has been displayed in the New Library Building, Civic Centre, Tunbridge Wells, and the opening ceremony was due to be performed at 2.45 p.m. yesterday afternoon by His Worship the Mayor of Tunbridge Wells, Alderman Charles E. Westbrook, O.B.E., J.P., C.C., in the presence of Southern Railway officers and civic officials. The exhibition will remain open until October 6. A neat descriptive catalogue has been pre-

instance of the strong revulsion of feeling in favour of railways at the beginning of the Railway Mania period. A connection with Tunbridge Wells was omitted from the original London and Dover Act of the South Eastern Railway in 1836 because of local opposition! In fact, the work of construction was nearly completed when the authorising Act was obtained, only seven weeks before the opening date. The Engineer was the famous Peter William Barlow (who was Engineer of the South Eastern Railway from 1844 to 1851), and it is worthy of note that his grand-daughter (Mrs. Selina Hannah Hewson), who travelled on the first train from Tunbridge Wells to London, survived until the present year, and died in Kensington on May 18, 1945, at the advanced age of 103.



Layout at Tunbridge, Southern Railway. The original east-south spur of 1845 is now a siding without connection at its southern end

pared by the Southern Railway, of which copies are available gratis to visitors.

As has been the case with previous Southern Railway centenary exhibitions at Shoreham, Dover, Maidstone, and Guildford, the exhibits have been selected to show not merely the events of 100 years ago, but to be representative of 100 years of railway history from the local railway viewpoint. Tunbridge Wells has had a particularly interesting history inasmuch as it occupied a strategic position on the London, Brighton & South Coast Railway, of which system it was an outpost. The South Eastern Railway never penetrated southward of Tunbridge Wells, although it made efforts to do so, and, in fact, succeeded in participating in the Eastbourne traffic, but the L.B.S.C.R. threw out branches from all directions so as to occupy territory west of Tunbridge Wells and forestall S.E.R. extension. Thus the Tunbridge-Hastings branch of the S.E.R. became a frontier of the two railways.

Tunbridge Wells was first provided with railway communication by the South Eastern Railway in 1845, by the construction of a branch from Tonbridge (then spelled Tunbridge), which was opened on September 20, 1845, and thus provides the immediate subject of the present centenary. Construction had been begun a year earlier, as terms had then been arranged with the landowners, who wished the works to be pressed forward with all speed, without waiting for legal authority. This was an

The Tunbridge Wells branch was 5 m. 18 ch. in length, with heavy gradients, sharp curves, and a lofty viaduct of 30 arches of a total length of 254 yd. There is a short tunnel (Somerhill) soon after leaving Tonbridge. The original proposal was for a single line, but the half-yearly report dated February 2, 1845, said that it had been decided to lay down two lines, and apparently this was done; certainly it was double in 1852. The first station at Tunbridge Wells was a temporary one, where the goods yard is now situated. The extension to the passenger station at Mount Pleasant, in the centre of the town, about half a mile farther south, was not opened until November 25, 1846. This extension was chiefly in tunnel and cost, with the station, an additional £80,000. The station is well below the surface of the ground and much confined.

As the branch from Tonbridge was laid on an almost continuous upgrade from the junction, a direct connection with the main line was deemed unsafe. Accordingly, it did not leave Tonbridge immediately to the east of the station, as now, but began 50 chains nearer Paddock Wood, and faced towards that station. The branch train from Tonbridge ran along the main line, into a siding on the up side and parallel with it. This siding ended at the first overbridge east of Tonbridge Station— $\frac{1}{2}$ mile distant. Some 220 yd. nearer Tonbridge the branch left the siding and curved away to the south-west on a rising

gradient for about half a mile. This is shown on the accompanying sketch plan. The form of the junction was thus similar to that at Folkestone, constructed 18 months earlier, which precludes trains running through to and from the Harbour branch without reversal. The reason for the construction was probably the same in each case—namely, the steep gradients on the branch, which made trains difficult to control with the meagre braking apparatus available 100 years ago.

Tunbridge Wells remained a terminus for only five years. The extension to Hastings was sanctioned in September, 1845, and the first portion (to Robertsbridge) was opened on September 1, 1851. Subsequent openings are shown on the chronological map opposite. For the better working of through traffic, a new spur was built at Tonbridge in 1857, leaving the main line immediately east of the station, on a sharp curve and on a rising gradient of 1 in 53. For many years a single-line connection on the "old branch" joined the new line, but about 32 years ago the original curve was made merely a siding for the main line, ending in buffer stops.

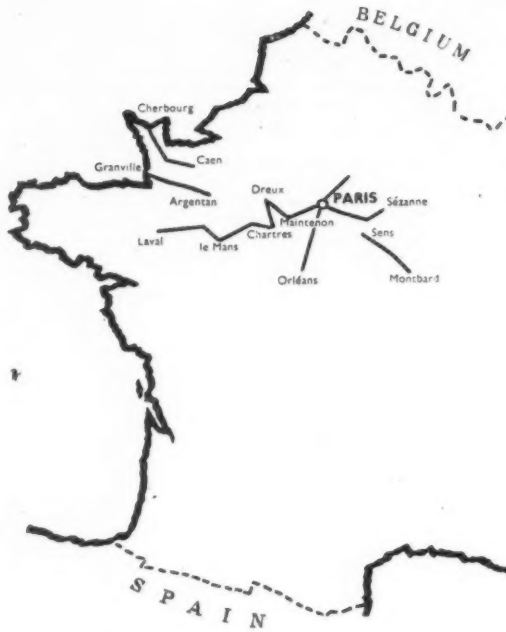
The S.E.R. had the monopoly of Tunbridge Wells traffic for 21 years, with the nearest L.B.S.C.R. railheads at East Grinstead (from 1855) and Uckfield (from 1858). The L.B.S.C.R. eventually approached from both directions, and reached Tunbridge Wells from East Grinstead on October 1, 1866. At this time the S.E.R. main line was *via* Redhill, so that the trains of both companies ran over the same route between London and Redhill. On June 1, 1868, the fast trains by the S.E.R. route were diverted to the Sevenoaks line (completed a month earlier). As shown on the map opposite, the L.B.S.C.R. proceeded to fill up the territory west of Tunbridge Wells with a series of lines which eventually gave that company no fewer than five services (three from London, and one each from Brighton and Eastbourne) terminating at its own Tunbridge Wells station. Under Parliamentary pressure, the two systems were linked at Tunbridge Wells on May 18, 1881, by a 52-chain single-line spur between the two stations.

The story of the competition between the two railways in this area is outlined in an interesting article by Mr. G. A. Sekon in the September-October issue of *The Railway Magazine*. After grouping, Tunbridge Wells (S.E.R.) became Tunbridge Wells Central on July 9, 1923, and the L.B.S.C.R. station was renamed Tunbridge Wells West in August of the same year. Southborough Station became High Brooms in September, 1925.

NON-FERROUS SCRAP METAL PRICES.—The Minister of Supply has issued a list of prices of non-ferrous scrap metal at Ministry depots at which the Minister is prepared to effect a sale to a buyer subject to having sufficient material of that particular quality available at a convenient depot at any particular time. The list relates to the period September 11, 1945, to December 31, 1945, but is published without prejudice or commitment. Without notice the schedule of materials may be amended in the light of changing circumstances, and prices may be altered in accordance with market conditions, production costs and other factors. The publication of the list does not constitute an offer of sale. Inquiries should be addressed in the first instance to the Directorate of Non-Ferrous Metals (Scrap Disposals Department), Euston House, London, N.W.1 (telephone: Euston 1260).

The Restoration of the French Train Services in 1944

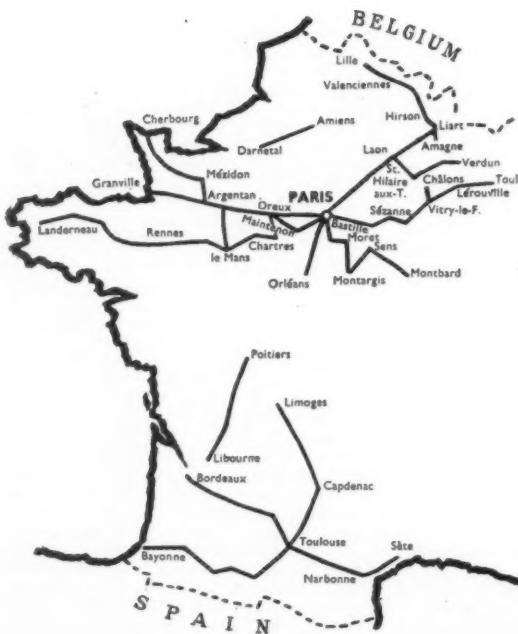
(See article opposite)



Map 1—Lines open to traffic on September 1, 1944



Map 3—Lines open to traffic on October 1, 1944



Map 2—Lines open to traffic on September 15, 1944; note the improvement in a fortnight as compared with Map 1 above



Map 4—Lines open to traffic on December 1, 1944; the restoration work of three months is shown by a comparison with Map 1

French Railway Resistance and Reconstruction

During the four years of German occupation of France, which lasted from June, 1940, to June, 1944, French railwaymen, like many of their fellow countrymen, resisted the efforts of the enemy to force collaboration upon them. In the underground struggle they enjoyed a double advantage. First a strategic position throughout the country of first-class importance, and secondly, a well-developed sense of professional comradeship and *esprit de corps* which combined to make even those who were not active resisters, silent accomplices of "The Terrorists" as they were officially described. Among the railwaymen every means was used from passive resistance, the maintenance of liaison, secret conveyance and intelligence, to active sabotage. In spite of punitive measures (300 railwaymen shot, more than 3,000 deported to Germany, not counting innumerable cases of temporary imprisonment), the struggle was intensified from year to year as the organisation developed, until towards the end of 1943 a central headquarters co-ordinated the efforts of the greater part of the resistance movement on the railways.

Passive resistance was naturally the first method employed, and to the end it remained the most widespread form of opposition. When in July, 1940, the railways began to function again, they were directly subordinated to enemy control. They were entirely at the disposal of the occupation authorities, and, owing to their strategic importance, subject to the severity of German military law. Every large station was placed under German direction and control. While endeavouring to keep supplies moving for the civilian population, French railwaymen caused confusion in enemy traffic by increasing delays in complying with administrative formalities, documents lost, rolling stock damaged, and goods trucks diverted to wrong destinations. At one goods yard, despite close surveillance by officials from the German railways, the staff contrived during shunting operations to change the labels and numbers of certain wagons urgently awaited in Germany and get them away in the opposite direction as far as Brioude in Central France, over 400 miles from the frontier.

When, immediately after the armistice, France was divided into three zones—coastal, occupied, and so-called "free"—communications between them were few, hazardous, and closely watched. Therefore the need arose for some kind of organisation by means of which information and orders to and from the underground movement could be passed from one zone to the other. This liaison work was undertaken by railwaymen whose employment obliged them frequently to cross the demarcation lines. It became normal practice for such messages to be carried in the guard's bag or hidden in some corner of the locomotive. Thereafter followed as a logical sequence the conveyance of passengers whose presence must be concealed from the enemy. These included escaped prisoners trying to enter the unoccupied zone, wanted members of the underground who had to be got away quickly, and, most important of all, those engaged on the dangerous mission of carrying orders and valuable information between the Continent and London.

In another direction, also, the railwaymen in France were particularly well-placed to render important service to the Allied cause and many helped in this way. It was the formation of a widespread and active intelligence service. From the train it was comparatively simple to note the building

of a new aerodrome or the latest improvements to the famous Atlantic Wall. The contacts they had almost everywhere, thanks to their normal perambulatory existence, made easy the gathering of those thousand and one items of information which added together make the sum total of successful intelligence. On two points of great importance the information they passed on could not have been excelled. These were the movements of German troops and supplies, and the results of Allied bombing of the railways.

The sabotage for the liberation campaign began relatively late in the occupation. It would have been of little help to the Allied cause in 1941 to provoke reprisals by indulging in such activities. In 1943 and 1944, however, the widespread and continuous cutting of communications took its place in the larger tactical plan of crippling the enemy's power of movement. Long before this moment arrived, preparation had been made so that when the order came to act in this or that area the rapid onset of such incidents was no spontaneous outbreak, but was the result of planned and orderly action by an efficient organisation. The importance and frequency of acts of sabotage were not the same all over the country. Certain areas were better fitted than others by the physical conformation of the country, the kind of railway installations, or the degree of efficiency in organisation achieved by the local action groups. The districts most closely involved were: in and around Dijon and Lyons, in the department of the Doubs, and in the Rhône Valley, all in the south-eastern part of France; at Langres, Lérerville and Conflans-Jarny in the eastern part of the country; and in Central France at Brive, Limoges, and further south at Montauban.

Complete statistics of the number of acts of sabotage committed are not at present available, but those which have been compiled are sufficient to show the scale of operations. In and around Dijon local groups of the "Resistance-Fer" were responsible from January to August, 1944, for 565 separate incidents, of which 269 involved a complete cessation of traffic on the lines attacked. In July, the period of greatest activity, there were in that one sector alone, 219 acts of sabotage (an average of 7 a day), of which 106 brought traffic to a standstill. In the neighbourhood of Lyons activity was nearly as intense: 568 incidents in the first eight months of 1944, of which 260 resulted in the complete immobilisation of traffic on the lines involved. The unscrewing of rails, although not taken into account, often had serious consequences for the enemy. On May 2, 1944, an incident of this kind was responsible for the derailment of 23 German wagons with 20 killed and 50 injured. On June 8 alone there were in the Lyons area 13 separate acts of sabotage and on July 14 nearly every railway line in this sector was cut: Lyons-Chalons, Lyons-Valence, Lyons-Grenoble, Lyons-Ambérieu, Lyons-Bourg, and Macon-Bourg.

RECONSTRUCTION

Once the liberation of the country was accomplished, the task began of getting the wheels turning again on the railways. Only 3,000 locomotives, 6,000 passenger vehicles, and 100,000 goods wagons were found to be in any way serviceable. Sabotage, the Allied bombardments, and finally the destruction wrought by the enemy as he retreated across France, left four large railway locomotive works out

of 10; 15 large carriage and wagon works out of 21; 71 out of 130 important depots; and 24 out of 40 big marshalling yards completely unusable. No fewer than 1,965 bridges, 27 tunnels, 115 out of 322 important stations, 570 signal cabins, and nearly 2,000 miles of track had been destroyed or so badly damaged as to be useless. On electrified sections of the line, 160 miles of overhead wires and 20 out of 66 sub-power stations were out of service. The supply of skilled labour was woefully insufficient and presented further problems of transport, lodging, feeding, clothing, and equipment, particularly in out-of-the-way and sparsely-inhabited localities.

The Allied armies undertook the provisional repair of the greater part of the transversal lines linking the Channel coast with the northern and north-eastern frontiers of France and those down the Rhône valley. The French National Railways were responsible for the repair of all the principal lines necessary for the transport of supplies to the civilian population, including those crossing the valleys of the Loire and the Rhône and serving Central and South-Western France. The speed with which this part of the job was accomplished can be judged by reference to the maps on the opposite page. By the beginning of 1945, traffic was moving again over 22,500 out of 24,000 miles of line. On September 30, 1944, more than 900 out of the 1,965 destroyed or badly damaged bridges had been made usable again. By January 1, 1945, only about 50 were still not open to traffic. By the beginning of 1945 the only main lines not restored were those on which bridges or similar important works had been destroyed and not then repaired, but 1,000 miles of track remained out of use owing to the lack of rails and sleepers.

All electrified lines, of added importance owing to the saving in coal thereby effected, have now been restored to service. The number of steam locomotives in service rose from 3,000 to over 5,000 by November 23, 1944, and to nearly 6,650 by April 1, 1945. The number of goods wagons in service increased from 100,000 to 166,400 by March 1, 1945.

IMPROVED TRAIN SERVICES

Improvements in train services followed quickly on the work of repair and reconstruction. The mileage of Paris suburban trains, which at the beginning of September, 1944, had dropped to 3,000, recovered to over 90,000 by January 1, 1945, or to 75 per cent. of what it was before D-Day and 50 per cent. of peacetime traffic. Improvements in main line services were achieved with greater difficulty owing to the widespread destruction and the shortage of fuel for locomotives. Nevertheless, the weekly total of loaded goods wagons, which in October, 1944, stood at only 24,000, had increased to 76,000 in January, 1945, and to 117,000 by the beginning of March. This represented 44 per cent. of pre-invasion traffic, but only one-eighth of the number handled in peacetime. The total distance covered by passenger trains increased from 356,000 miles at the end of September, 1944, to 879,000 by the beginning of January, 1945, or 54 per cent. of what it was before D-Day, but only 15 per cent. of peacetime traffic.

The foregoing facts and figures are extracted from an admirable booklet, printed in English, and issued by the French Railways Limited (of 179, Piccadilly, London, W.1) under the title "Resistance and Reconstruction: French Railways." From this booklet also are reproduced the four maps on the opposite page, and the illustrations on page 294.

Notes and News

Clayton Dewandre Co. Ltd.—The directors of Clayton Dewandre Co. Ltd. have declared an interim dividend of 4 per cent. (same).

Locomotive Draughtsmen Required.—Two locomotive draughtsmen with diesel traction experience are required by a locomotive manufacturing concern. See Official Notices on page 303.

Cammell Laird & Co. Ltd.—The interim ordinary dividend of Cammell Laird & Co. Ltd. is being maintained at 4 per cent., less tax, the same rate as for each of the preceding seven years.

Railway Accident in Argentina.—It is reported that over thirty persons were killed, and a number injured, when a train on the Argentine State Railways was derailed on September 9.

District Locomotive Superintendents Required.—Two district locomotive superintendents are required by the Sudan Railways. Candidates must be fully-qualified locomotive engineers both in theory and in practice. See Official Notices on page 303.

Assam Railways & Trading Co. Ltd.—The Assam Railways & Trading Co. Ltd. is now repaying 50 per cent. of the £630,000 "A" stock at 120 per cent., plus 13 years of dividend arrears and 60 days of dividend which total £105 6s. 3d. per cent. gross, or £62 6s. 2d. per cent. net.

Institution of Locomotive Engineers.—The opening General Meeting (Session 1945-46) will be held on Wednesday, September 26, at 6 p.m., in the Hall of the Institution of Mechanical Engineers, Storey's Gate, London, S.W.1. A Presidential Address will be given by Mr. W. S. Graff-Baker.

Port of London Order.—Under the Special Enactments (Extension of Time) Act, 1940, the Minister of War Transport has made an Order entitled "The Port of London Act, 1935 (Extension of Time) Order, 1945," modifying certain provisions as to time laid down in Section 21 of the Port of London Act, 1935.

L.N.E.R. Redeemable Debenture Stock.—For the purpose of preparing warrants for interest payable on October 15 on the L.N.E.R. 5 per cent. redeemable debenture stock, the balance will be struck as at the close of business on September 28, and such interest will be payable only to those stockholders whose names are registered on that date. See Official Notices, on page 303.

Road Accidents in July, 1945.—The return issued by the Ministry of War Transport of the number of persons reported to have died, or to have been injured, as a result of road accidents in Great Britain during the month of July last, shows 444 deaths (compared with 511 in July, 1944), 2,942 seriously injured (compared with 2,842 in July, 1944), and 9,486 slightly injured (compared with 7,460 in July, 1944).

Repair of Italian Railways.—It was reported from Rome on August 24 that the restoration of railway communications in Italy has proceeded so well that daily train services are now running between Rome and the three principal northern cities—Milan, Turin, and Genoa. The pre-war journey from Rome to Milan took eight hours; under present conditions it takes 30, but the train includes a sleeping

car. A first-class ticket to Milan costs slightly less than £4, which, however, is about a third of what is at present being paid for a seat in a motorcoach.

The Vienna Locomotive Industry.—The Wiener Lokomotivfabrik Aktiengesellschaft paid a dividend of 4 per cent. for its last working year (1943/1944) under German control.

Chinese Rolling Stock Recovered from Japanese.—Reuters reports that 1,060 locomotives, 1,877 coaches and 12,982 freight vehicles which were under the control of the Japanese in China have been recovered by the Chinese.

Engineering Draughtsman Required.—An engineering draughtsman is required by the Iraqi Government Railway for three years in the first instance. Candidates must have had, among other things, considerable experience in a large drawing office. See Official Notices, on page 303.

Institute of Welding.—The Sir William J. Larke Medal Prize Paper, "The Fabrication of Aircraft Fuel Tanks in Aluminium Alloy Containing 3 per cent. Magnesium," will be read by Mr. W. K. B. Marshall, at 6 p.m., Wednesday, October 3, at the Institution of Civil Engineers, Great George Street, Westminster, S.W.1.

The Permanent Way Institution.—The London Section of the Permanent Way Institution is holding its monthly meetings during the coming autumn and winter months and the following lectures have been arranged:—

Saturday, October 20. "Not According to Plan," by Mr. B. P. Fletcher, M.B.E., M.Inst.C.E.
Saturday, November 17. "Accidents," by Mr. L. Moore, O.B.E.

Saturday, December 15. "The Shape of Things to Come," by R. C. Rattray, B.Sc., A.M.Inst.C.E.

January, 1946. Lantern Lecture: "A Description of Special Works Carried Out by the London Transport Board During Wartime," by Mr. A. C. Edrich (L.P.T.B.).

Mexican Railway Company.—The government of Mexico has opened negotiations for the purchase of the British-owned Mexican Railway Company, operators of a railway running between Mexico City and Vera Cruz. Although no official statement has been issued as yet it was reliably reported that the company is asking 45,000,000 pesos (about £1,800,000), with the Mexican government offering 40,000,000 pesos (about £1,600,000). Officers of the railway refused to confirm or deny reports published in Mexico City newspapers that certain American interests had offered 55,000,000 pesos (about £2,200,000) for the railway.

F.B.I. President's Message to Industry.—Sir Clive Baillieu, President of the Federation of British Industries, recently sent the following message to members of the Federation: "Industry is very conscious of the vast and challenging problems which today confront the country. We attach the greatest importance, therefore, to the success of the Thanksgiving Week's Campaign now being organised throughout the United Kingdom. We all realise the magnitude of the financial and economic problems facing this country as a result of the concentration of all-out production for war and the cessation of Lend-Lease. We know, too, the results that would follow in the period of transition from war to peace if there were ample money to spend with only limited supplies of goods available.

Inflation must be avoided and our finances soundly maintained. I have no doubt members of the Federation will do all in their power to ensure the success of this national drive for savings and investment."

Thos. W. Ward Acquires Steel Company.—Thos. W. Ward Limited, Albion Works, Sheffield, has purchased the Wolverhampton Steel & Iron Co. Ltd. (in liquidation) from the receiver and manager as a going concern, and the works will be continued at full capacity, trading as the

British and Irish Railway Stocks and Shares

Stocks	Highest 1944	Lowest 1944	Prices	
			Sept 18, 1945	Rise/ Fall
G.W.R.				
Cons. Ord.	62½	55	51½	— ½
5% Con. Pref.	122½	114½	106½	— 3½
5% Red. Pref. (1950) ..	110½	104	103	—
5% Rt. Charge	135½	128	123	—
5% Cons. Guar.	134½	125	122	— 1
4% Deb.	118½	112½	106½	— 1½
4½% Deb.	118½	114	109½	—
4½% Deb.	124½	119½	113	—
5% Deb.	137	129½	126	—
2½% Deb.	77	73½	80½	+ 4
L.M.S.R.				
Ord.	34½	27½	25½	—
4% Pref. (1923)	64½	55	53½	—
4% Pref.	81	72½	70½	—
5% Red. Pref. (1955) ..	105½	102	101½	—
4% Guar.	107½	99½	99½	—
4% Deb.	111½	104	103	— ½
5% Red. Deb. (1952) ..	111	108	106½	— 1
L.N.E.R.				
5% Pref. Ord.	10½	7½	6	— ½
Def. Ord.	5½	3½	3	—
4% First Pref.	68½	55½	52½	—
4% Second Pref.	35½	28½	26½	— ½
5% Red. Pref. (1955) ..	101	97½	98	—
4% First Guar.	101½	96½	96	— ½
4% Second Guar.	95½	88½	90	— 1
3% Deb.	88½	80½	83	— ½
4% Deb.	110½	103½	102	— 2
5% Red. Deb. (1947) ..	105½	101½	101½	—
4½% Sinking Fund Red. Deb.	107	104½	104½	—
SOUTHERN				
Pref. Ord.	80½	71½	66½	— ½
Def. Ord.	26½	23	22	— ½
5% Pref.	122½	113½	104½	— 3½
5% Red. Pref. (1964) ..	117½	112½	110½	— 1½
5% Guar. Pref.	134	125½	118½	— 1½
5% Red. Guar. Pref. (1957)	115½	112½	108	— 2
4% Deb.	118	110	105½	— 1½
5% Deb.	135½	127	126	—
4% Red. Deb. (1962- 57)	111½	107½	106½	— 2
4% Red. Deb. (1970- 80)	112	108½	106½	— 2
FORTH BRIDGE				
4% Deb.	107	103	104	—
4% Guar.	106½	102	103	—
L.P.T.B.				
4½% "A"	125	119	119½	—
5% "A"	133½	128	129½	+ 1
3% Guar. (1967-72) ..	99½	98	99	—
5% "B"	124½	118½	118½	+ ½
"C"	72½	64½	63	+ ½
MERSEY				
Ord.	35½	33	32	— 1
3% Perp. Pref.	72	66	69	—
4% Perp. Deb.	105	103	104	—
3% Perp. Deb.	85½	79½	80	—
IRELAND*				
BELFAST & C.D.				
Ord.	9	6	6½	—
G. NORTHERN				
Ord.	33½	19	30	+ ½
Pref.	49	37	47½	—
Guar.	70	57½	74	—
Deb.	90½	81½	89	— 1
IRISH TRANSPORT				
Common	—	—	78½	— 1½
3% Deb.	—	—	100½	+ ½

* Latest available quotation

OFFICIAL NOTICES

Sudan Government

None of the vacancies on this page relates to a man between the ages of 18 and 50 inclusive unless he is exempted from the provisions of the Control of Employment Order, 1945, or the vacancy is for employment excepted from the provisions of that Order.

A JUNIOR SALES ENGINEER required by large firm in North of England. Applicant should have good education followed by apprenticeship in Railway Engineering. Knowledge of Motor Trade an asset. Age should not exceed 30. Permanent position with good prospects. Write giving full details of experience and salary required.—Box 308, c/o *The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1

OVERSEAS EMPLOYMENT: ENGINEERING DRAUGHTSMAN required by the Iraqi Government Railway for three years in the first instance. Salary between I.D. 40 and I.D. 50 a month, according to qualifications and experience, plus high cost of living allowance between I.D. 11½ and I.D. 15 a month, according to salary and dependants. (I.D. 1 = £1.) The post is not pensionable, but there is a Provident Fund. Free passages. Candidates must have had considerable experience in a large drawing office and possess a sound knowledge of building construction, including the design of steel and reinforced concrete bridges and structures; or alternatively have had experience in a civil engineering drawing office on a British or Colonial Railway and have a good knowledge of permanent way layout.

Written applications (no interviews) giving the following essential details: (1) Full name, (2) Date of birth, (3) Industrial training and experience, (4) Name and address of present employers, (5) Details of present work, should be sent to The Secretary, Overseas Manpower Committee (Ref. 1603), Ministry of Labour and National Service, York House, Kingsway, London, W.C.2.

Wolverhampton Steel & Iron Company (Proprietors Thos. W. Ward Limited), Osier Bed Works, Wolverhampton.

Southern Railway Lecture and Debating Society.—This Society's activities, which were suspended after the 1939-40 session, are being resumed in the coming autumn and winter and a comprehensive programme of lectures has been arranged as follows:—

October 11	"Putting the Sun in the Southern"	Mr. C. Grasmann, M.A., Public Relations & Advertising Officer
November 8	"Air Topics"	Mr. D. H. Handover, M.Inst.T., Air Adviser to the British Railways
December 13	"D-Day at Southampton Docks"	Mr. H. A. Short, M.C., M.Inst.T., Docks & Marine Manager
January 10, 1946	"The Work of the Civil Engineering Department of the Southern Railway"	Mr. V. A. M. Robertson, C.B.E., M.C., M.Inst.C.E., Chief Civil Engineer
February 14	"The Electrification of the Southern Railway"	Mr. S. B. Warder, M.I.Mech.E., Assistant for New Works to the Chief Electrical Engineer
March 7	"Colour Films of Railway Progress"	Mr. J. R. Hind, A.M.Inst.T., British Railways Press Officer
April 4	"Some Thoughts on Transport Education and Training in the United Kingdom"	Mr. J. A. R. Turner, A.M.Inst.T., Chief Civil Engineer's Department

The meetings will be held at The Chapter House, St. Thomas' Street, S.E.1, commencing at 5.45 p.m.

Coast Lines Limited.—Speaking at the 32nd annual ordinary general meeting of Coast Lines Limited, Sir Alfred Read, Chairman and Managing Director, said that the company was composed of various forms of transport—sea, land and air—and operated services to and from all the principal ports of the United Kingdom, cross-Channel passenger, cargo and cattle services to and from Ireland, and cargo services to the Continent and the Channel Islands. In addition to docks and wharves, it had interests in the coal trade, ship-building, road haulage and air services. These various activities were carried out by the main company and 32 subsidiary companies and were controlled through a

SUDAN RAILWAYS require the services of TWO DISTRICT LOCOMOTIVE SUPERINTENDENTS. Candidates must be fully qualified Locomotive Engineers both in theory and in practice. Must have graduated in Mechanical Engineering from a University and/or must be Corporate Members of the Institution of Civil Engineers or of the Institution of Mechanical Engineers, must have served an apprenticeship or pupillage of not less than four years on a railway or with a firm of locomotive builders of repute and must have filled a position of responsibility in Locomotive Engineering for not less than one year.

TERMS:

Either (1) Starting rate of pay £E.480 per annum, or such higher rate as age and qualifications justify, with periodical increases of pay in accordance with Government Scales, viz., £E.480-540-600-660-720-780-852-936, all increases being biennial with the exception of the last one which is triennial. Selected candidates will be appointed on Probationary Contract for two years and subscribe to the Provident Fund, after which, if accepted to serve towards pension, their contributions will be transferred to the Pension Fund.

or (2) Short Term Contract for two years, which may be extended for further periods. Pay £E.640 per annum or such higher rate as age and qualifications justify. A bonus of one month's pay for each completed year of service will be given at the termination of the contract.

£E.1 = £1. 0s. 6d. Separation allowance or Special War Allowance payable when eligible. Free passage on appointment. Strict medical examination. At present there is no income tax in the Sudan.

Write quoting C.2798A to Ministry of Labour and National Service, Appointments Department, Tech-

nical and Scientific Register, Room 670, York House, Kingsway, London, W.C.2, for application form which must be returned completed by 20th October, 1945.

INTERNATIONAL OIL COMPANY requires young trained Railway Engineer (Mechanical) for post as Lubrication Sales Engineer in Great Britain.—Apply, with full details, to Box No. 149, c/o *The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

REQUIRED by an established Locomotive Manufacturing concern, two Locomotive Draughtsmen with diesel traction experience, to develop designs and ultimately supervise work in the capacity of Leading Draughtsmen.—Applications should be made in writing, giving detailed particulars of experience, age, etc., to "1092," Wm. Porteous & Co., Advertising Agents, Glasgow.

London and North Eastern Railway Company

NOTICE is hereby given that, for the purpose of preparing the Warrants for Interest payable on the 15th October, 1945, on the Company's 5 per cent. Redeemable Debenture Stock, the balance will be struck as at the close of business on 28th September, and such Interest will be payable only to those Stockholders whose names are registered on that date.

Transfers of the 5 per cent. Redeemable Debenture Stock should, therefore, be lodged with the Registrar of the Company at Hamilton Buildings, Liverpool Street Station, London, E.C.2, before 5.0 p.m. on 28th September.

By Order.

W. H. JOHNSON,
Secretary of the Company.

Marylebone Station,
London, N.W.1.
18th September, 1945.

network of 100 offices in various parts of the British Isles. The organisation was thereby brought into close touch with dock and harbour authorities throughout the country and it continued to enjoy the goodwill and friendship of the railway and other transport companies.

Winter Train Services.—Considerable improvements are being introduced into the winter train services which will come into effect on October 1. They include a number of additional main-line trains and reduced timings, and the running of more relief trains. The Ministry of Transport has authorised the running of restaurant cars on 84 trains. Further details of the improved services will be given in our next week's issue.

Waste Paper Recovery.—The vital need of further salvage of waste paper is being stressed by the Waste Paper Recovery Association of Fleet Street, London. It is pointed out that paper is required by industry as much in peacetime as in war, and to draw public attention to the urgency of the need a mobile exhibition is being held from September 15 to 22 in Hyde Park, London, near the Marble Arch. The exhibition will demonstrate the uses of waste paper for making plaster boards for houses, for plastics, electric cable insulation, refrigeration chamber linings, engine gaskets, sound insulators, food packages, and many other purposes.

Richard Thomas & Baldwins Limited.—The results announced by Richard Thomas & Baldwins Limited are the first since the fusion of the two undertakings came into operation in January this year. The report of Baldwins Limited for the year ended December 31, 1944, was given on page 434 of our issue of April 27, 1945, and showed that it included the last balance sheet of that company as a manufacturing concern. The net profit of the combined undertaking for the year ended March 31, 1945, after providing for taxation and including the net profit for the period January 1 to March 31, 1945, of the works taken over from Baldwins, but not including any profits or dividends from associated companies or overseas subsidiaries taken over, was £819,599. By the payment of a

further 3½ per cent., less tax, on the 6½ per cent. participating preference shares, the total dividend on these shares is maintained at 10 per cent. The ordinary dividend for the year is 12½ per cent., less tax.

Contracts and Tenders

The Belgian National Railways Company has ordered a total of 220 steam locomotives from Canada; 80 from the U.S.A.; and 213 from Belgian factories.

Seventy-five air-operated steel side-tipping wagons, each of 70 tons carrying capacity, for track-maintenance work, have been ordered by the Canadian Pacific Railway from the National Steel Car Corporation Limited. It is stated that delivery of the wagons is subject to Government priority.

Below is a list of orders placed recently by the Egyptian State Railways:—

Guest Keen Baldwins Iron & Steel Co. Ltd. Fishplates.
Standard Telephones & Cables Limited: Bakelite cases.
Charles Richards & Sons Ltd.: Nuts.
Steel Peech & Tozer Branch of The United Steel Cos. Ltd.: Spring steel.
Le Corbone Limited: Zinc plates.
Siemens Brothers & Co. Ltd.: Tumbler switches.
General Electric Co. Ltd.: Conduit tubing.
Chloride Electric Storage Co. Ltd.: Cells.
Midland Electric Manufacturing Co. Ltd.: Cut-out bases.
Dow-Mac (Products) Limited: Concrete sleepers.
Blaenavon Co. Ltd.: Carriage tyres.
Alfred Herbert Limited: Coventry chuck.
W. & T. Avery Limited: Steam pressure gauges.
Norton Grinding Wheel Co. Ltd.: Grinding wheel segments.
Tuck & Co. Ltd.: Asbestos packing.
Dick's Asbestos Co. Ltd.: Asbestos packing.

Forthcoming Meeting

September 29 (Sat.).—The Permanent Way Institution, Lecture Hall, Town Hall Library, Blackpool. 3 p.m. "Use of Electrodes and Welding of Metals and Alloys," by Mr. H. Martin of Murex Welding Processes Limited.

Railway Stock Market

With investment interest centred on London's savings week drive, business in stock markets has been at a low ebb in most sections; gold mining shares, exceptionally, attracted increased attention. British Funds strengthened on the Chancellor's reference to the possibility of further reduction in interest rates, but later, earlier gains were not fully held. The rise in gilt-edged helped to impart firmness to industrials and small gains predominated, with the main emphasis on shares of companies likely to play an important part in rebuilding exports, including electrical equipment shares and those of locomotive builders and engineers. The uncertainty still prevailing as to Government policy and the importance of the Anglo-American talks, however, maintained a waiting attitude generally, although hopeful views were indicated by the small amount of selling in evidence.

Home railway junior stocks moved within narrow limits, with prior charges recording further declines, although attention is being drawn in the market to the extent of the cover for interest requirements. The high investment status of these prior charges, of course, would have to receive full recognition in any nationalisation developments that may be in prospect. Junior stocks attracted little fresh demand, although any decline appeared to bring in buyers. L.M.S.R. 4 per cent. debentures now yield nearly $3\frac{1}{2}$ per cent., L.N.E.R. 3 per cent. debentures nearly $3\frac{1}{2}$ per cent., and Great Western and Southern 4 per cent. debentures return approximately $3\frac{1}{2}$ per cent. at current prices. Moreover, Southern and

Great Western 5 per cent. preference return more than $4\frac{1}{2}$ per cent. and L.M.S.R. 1923 preference as much as $7\frac{1}{2}$ per cent. Elsewhere, yields range up to nearly $10\frac{1}{2}$ per cent. on L.N.E.R. second preference. L.M.S.R. ordinary returns $9\frac{1}{2}$ per cent. and Southern deferred 9 per cent.

Argentine railway stocks, after further moderate declines, became firmer on revived talk that the British Government, recognising the vital importance of our remaining overseas investments, may draw attention to the just claims of the railways to fair treatment. The latter is becoming a matter of urgency in view of the large sums required to rehabilitate the railways, which must play an important part in expanding prosperity in the Argentine if the Republic is to have its full share in rebuilding international trade.

Compared with a week ago, Great Western ordinary has receded from $52\frac{1}{2}$ to $51\frac{1}{2}$; the 5 per cent. preference moved down from 110 to $107\frac{1}{2}$, the guaranteed stock from $119\frac{1}{2}$ to 119, and the 4 per cent. debentures eased from 107 to $106\frac{1}{2}$. L.M.S.R. at $25\frac{1}{2}$ was fractionally lower on balance, the senior preference receded from $70\frac{1}{2}$ to 70, and the 1923 preference also was $\frac{1}{2}$ down at $52\frac{1}{2}$. L.N.E.R. second preference was $\frac{1}{2}$ lower at $26\frac{1}{2}$, the first preference also moving back from $52\frac{1}{2}$ to $51\frac{1}{2}$, and the first guaranteed eased to 96. Southern deferred was 22, compared with $22\frac{1}{2}$ a week ago, the preferred 67, compared with $67\frac{1}{2}$, while the 5 per cent. preference lost two points at 106. London Transport "A" and "B" stocks again

moved higher, but the "C" was $\frac{1}{2}$ down at $62\frac{1}{2}$. The decline in railway prior charges reflects reduced demand since the threat of nationalisation. There does not appear to have been a great deal of selling. As indicated above, yields are now attractive when judged in relation to the cover for interest requirements. This should, of course, tend to improve demand, and moreover, if there were a further reduction in interest rates, it can be assumed that in common with other high-class investments, home railway prior charge stocks would respond in price.

The rally in Argentine rails was confined mainly to debenture stocks. Buenos Ayres Great Southern 4 per cents. recovered from 65 to 66; the ordinary stock was $11\frac{1}{2}$, compared with $11\frac{1}{2}$ a week ago, and the 5 per cent. preference improved from $26\frac{1}{2}$ to $26\frac{1}{2}$. Buenos Ayres Western 4 per cent. debentures were a point up at 60, and Central Argentine 5 per cent. debentures recovered from 66 to $67\frac{1}{2}$. Buenos Ayres & Pacific consolidated debentures improved to 63 after an earlier decline to 62. Entre Rios 4 per cent. debentures were maintained at 64. Antofagasta Railway issues improved and Nitrate Rails ordinary were better at 72s. 6d. on the view that demand for nitrate will expand and that there is likely to be less competition than pre-war from the synthetic product. United of Havana 1906 debentures receded further to $19\frac{1}{2}$. Canadian Pacific declined to $19\frac{1}{2}$, moving closely with other dollar stocks.

BRITISH OXYGEN CO. LTD.—The interim ordinary dividend of British Oxygen Co. Ltd. is 8 per cent., less tax at 9s. 8d. in the £.

Traffic Table and Stock Prices of Overseas and Foreign Railways

Railways	Miles open	Week ended	Traffic for week		No. of Week	Aggregate traffic to date			Shares or Stock	Prices					
			Total this year	Inc. or dec. compared with 1943/4		Totals		Increase or decrease		Highest 1944	Lowest 1944	Sept. 18 1945	Yield % (See Note)		
						1944/5	1943/4								
South & Central															
Antofagasta (Chili) & Bolivia	834	9.9.45	£ 26,630	—	1,960	36	£ 1,071,870	£ 1,036,100	+	£ 35,770	Orl. Stk.	13½	9½	10	Nil
Argentine North Eastern	753	8.9.45	17,894	—	75	10	191,681	173,575	+	18,106	"	6½	4½	8	Nil
Bolivar	174	Aug., 1945	5,035	—	819	34	39,437	42,517	—	3,080	6 p.c. Deb.	18½	7½	8	Nil
Brazil	2,771	8.9.45	120,875	+	4,125	10	1,235,125	1,176,312	+	58,813	Bonds	19½	15	23½	Nil
Buenos Ayres & Pacific	5,080	8.9.45	197,625	+	16,938	10	1,952,187	1,732,312	+	219,875	Ord. Stk.	7½	3½	6	Nil
Buenos Ayres Great Southern	1,924	8.9.45	71,750	+	750	10	682,062	640,750	+	41,312	Ord. Stk.	14½	9½	11½	Nil
Buenos Ayres Western	3,700	8.9.45	200,375	+	13,597	10	1,907,140	1,784,053	+	123,087	"	13½	9½	11½	Nil
Central Argentine	Do.	—	—	—	—	—	—	—	—	—	10½	6½	8½	Nil	
Do.	—	—	—	—	—	—	—	—	—	—	Did.	4½	3	4	Nil
Uent. Uruguay of M. Video	972	1.9.45	33,767	+	5,829	9	309,551	285,437	+	24,114	Ord. Stk.	5½	4	6½	Nil
osta Rica	262	July, 1945	31,093	+	2,771	4	—	—	—	—	Stk.	17½	14½	15	Nil
orad	70	Aug., 1945	29,000	—	875	34	243,335	207,565	+	35,770	1 Mt. Deb.	101	101	101½	£5/18
ntre Rios	808	8.9.45	24,981	+	2,006	10	264,493	236,212	+	28,281	Ord. Stk.	6½	4½	6½	Nil
Great Western of Brazil	1,030	8.9.45	19,700	+	1,400	36	873,200	767,900	+	105,300	Ord. Sh.	38½	23½	25½	Nil
International of Cl. Amer.	794	July, 1945	£224,789	+	£78,819	30	£1,490,855	£1,354,082	+	£136,773	—	—	—	—	Nil
Interoceanic of Mexico	22½	Aug., 1945	6,213	—	3,142	34	49,503	64,295	—	14,792	1st Pref.	1½	½	1	Nil
La Guaira & Caracas	1,918	8.9.45	66,386	+	11,273	36	1,830,445	1,645,074	+	185,371	5 p.c. Deb.	88	79	76½	7/65d
Leopoldina	483	7.9.45	482,100	ps.	25,500	9	ps. 6,220,800	ps. 4,877,100	+	ps. 1,343,700	Ord. Stk.	5½	4½	4	Nil
Mexican	319	June, 1945	21,830	—	6,402	52	217,882	203,238	+	14,644	Ord. Stk.	4	4	1½	Nil
Midland Uruguay	382	15.9.45	9,904	+	3,717	36	132,226	132,243	—	17	Ord. Sh.	75/10	65/10	70½	£3/11
Nitrate	113	June, 1945	4,575	—	2,189	52	66,965	91,572	—	24,607	—	—	—	—	Nil
North Western of Uruguay	274	7.9.45	£60,331	—	£2,444	10	£635,914	£572,937	+	£62,977	Pr. Li. Stk.	79½	68	77½	£7/14
Paraguay Central	1,059	Aug., 1945	148,453	+	21,368	8	283,203	245,725	+	37,478	Pref.	9	10	9½	Nil
Peruvian Corporation	100	July, 1945	c 95,000	+	c 7,000	4	—	—	—	—	—	—	—	—	Nil
Salvador	153½	—	—	—	—	—	—	—	—	—	Ord. Stk.	57½	46	56½	£5/4
San Paulo	156	Aug., 1945	2,415	—	1,308	8	5,535	4,200	—	1,335	Ord. Sh.	21½	13/9	13/9	Nil
Taital	1,301	8.9.45	40,098	—	7,515	10	436,241	480,559	—	44,318	Ord. Stk.	4	2½	1½	Nil
United of Havana	73	June, 1945	1,460	—	52	52	19,568	17,929	+	1,639	—	—	—	—	Nil
Uruguay Northern	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Nil
Canada															
Canadian National	23,569	July, 1945	1,816,800	+	68,400	30	9,696,400	8,196,600	—	248,600	—	—	—	—	Nil
Canadian Pacific	17,028	14.9.45	1,273,800	+	13,200	36	44,529,400	44,578,800	—	49,400	Ord. Stk.	17½	13½	19½	2½
Various															
Barsi Light	202	June, 1945	19,620	—	4,185	14	74,595	75,487	—	892	Ord. Stk.	129½	97½	129½	£3/6
Beira	204	June, 1945	80,259	—	11,581	42	—	—	—	—	—	—	—	—	Nil
Egyptian Delta	607	20.8.45	13,914	—	2,739	20	226,944	259,759	—	32,815	Prf. Sg.	7½	5½	6½	Nil
Manila	—	—	—	—	—	—	—	—	—	—	B. Deb.	63½	58	69	Nil
Midland of W. Australia	277	July, 1945	13,766	—	5,412	4	13,766	19,178	—	5,412	Inc. Deb.	101½	99½	95½	£4/3
Nigeria	1,900	26.5.45	277,630	+	23,531	8	1,823,785	1,739,068	+	84,717	—	—	—	—	Nil
Rhodesia	2,445	June, 1945	522,625	+	40,423	42	—	—	—	—	—	—	—	—	Nil
South Africa	13,301	11.8.45	995,636	+	114,231	19	18,795,898	16,389,329	+	2,406,569	—	—	—	—	Nil
Victoria	4,774	April, 1945	1,285,324	+	96,325	—	—	—	—	—	—	—	—	—	Nil

Note. Yields are based on the approximate current price and are within a fraction of $\frac{1}{4}$. Argentine traffic is given in sterling calculated @ 16 pesos to the £. Receipts are calculated @ 1s. 6d. to the rupee.